

COMPUTERWORLD

Mac users fight Win 95 threat

Lockheed weighs shift to single platform

By Lisa Picarile

Macintosh users at Lockheed Martin Missile and Space, one of Apple Computer, Inc.'s largest customers with more than 9,100 Macintoshes, may be forced to parachute to Windows 95.

But not without a fight, they said last week.

As part of its mission to cut costs and reassert control over its more than 15,000 desktop systems, the



Eric S. Heston

once high-flying Lockheed Martin is considering a formal proposal to jettison the Macintosh in favor of Pentium-based systems running Microsoft Corp.'s Windows 95, according to four sources at Lockheed Martin.

Geoffrey Phillips, a mission systems analysis manager at the company, said he has presented this proposal twice to senior management and that an executive committee has been formed to evaluate the proposal.

Lockheed Martin, page 129

HP, partners to untangle net alarms

By Steve Moore

Hewlett-Packard Co. plans to join forces this week with two network players — NetLabs, Inc. and Network Computing, Inc. — to create unprecedented integration among network and systems management products. Computerworld has learned.

The product linkage should provide a long-awaited boost to users struggling to figure out the relationships among a wide variety of alerts and alarms flooding in from far-flung networks and systems.

Sources close to the companies confirmed last week that HP will integrate its OpenView Operations Center systems management application with NetLabs' NetViewCenter event correlation engine. That in turn will be integrated with Network Computing's LANAlert LAN management software.

This integration will enable OpenView users to correlate alarms from TCP/IP networks and Novell, Inc. IPX networks. HP, page 129



In today's distributed computing environments, administrators must manually figure out the relationships among the alarms and alerts received from multiple systems and network devices.

Info warfare risk growing

By Gary H. Antnes
WASHINGTON

Senior U.S. military officials said last week that the likelihood of enemy attacks against domestic information systems is mounting.

And they warned that both the

military and private sectors are ill-prepared for the threat from future wars, which will be waged as much with bytes as with bullets.

The Pentagon publicly acknowledged that it is developing electronic weapons to attack the information systems of its adversaries.

"We do have offensive capabilities, and we are working on others. You'd feel good about it if we could talk about it," Assistant Secretary of Defense Emmet Paige Jr. said of the top secret program. Paige spoke at a seminar sponsored by the National Defense University and the National Security Industrial Association last week.

Experts said commercial entities such as stock exchanges, telecommunications switches, air

Info warfare, page 118

Dirty rotten scoundrels?

There are pirates, snoops and copyright outlaws among you

By Mitch Betts

End users get the blame, but when it comes to making illegal copies of commercial software, information systems professionals themselves are often the devilish pirates, according to an exclusive Computerworld ethics survey of 255 IS professionals in corporate America.

The wide-ranging survey also reveals that 15% of IS professionals sympathize with hackers (see page 102) and 6% admit

In Depth, page 101



Mea culpa

Have you made unauthorized copies of commercial software?

Typical reason: "To try it out before buying it."



Base: 255 IS professionals

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Vendor strategies

EMC storms IBM disk drive gates

By Craig Stedman
ROCKFORD, ILL.

When EMC Corp. introduced its first Symmetrix mainframe disk arrays in late 1990, the upstart could not attract a single person to the swank New York hotel ballroom it proudly rented for the occasion. Twelve EMC employees were reduced to giving speeches to each other.

"It was a shot that was not heard 'round the world," quipped Michael Ruetters, then an EMC vice president and now president and chief executive officer.

Ruetters can afford to laugh now because the Symmetrix arrays were indeed revolutionary. They were the first mainframe storage devices built around commodity 5 1/4-in. disk drives at a time when IBM and other vendors were still wed to larger, slower and more expensive proprietary drives.

Performance-starved users were only too glad to support EMC's innovation. Five years of stunning market share gains later, the company is hiding to oust IBM from its previously unassailable perch atop the mainframe disk shipment throne (see chart, page 28).

As a result, EMC will not have to worry about being starved for attention when it adds Unix versions of the Symmetrix arrays next month. IBM and other vendors also plan to adapt their mainframe products to take advantage of the growth in open systems, but EMC will again be the first with heavy-duty centralized Unix storage, analysts say.

EMC, page 28



EMC President Michael Ruetters (left) and Mark Yonai, vice president of mainframe engineering and chief Symmetrix architect



Breakout!

IS groups are escaping the limits of popular application development tools by using new enterprise-ready products. **CW Guide**, page 93. At the same time, end users are finding ever more powerful data access tools. **Marketplace**, page 120.

■ Hardware vendors such as Compaq and NEC are betting on **Windows NT** as an application server. Meanwhile, Compaq brings its PCs further into the enterprise with a new database-application server **NEWS**, page 4

■ IBM prepares an **APTN** strategy that isn't pure IBM **NEWS**, page 6

■ Digital gives a boost to the VAX-based version of OpenVMS. **NEWS**, page 7

■ New Sybase middleware gives a nod to remote users. **NEWS**, page 8

■ Client/server implementation tools save some time, but even they won't make a project quick and easy. **NEWS**, page 10

■ Bay Networks survived early bumps in its merger but now faces the hard part: delivering products. **NEWS**, page 12

■ Network management could prove to be one new user for the World-Wide Web. **NEWS**, page 14

■ Mike Maples' early retirement sparks reorganization at Microsoft. **NEWS**, page 24

■ Parity's competition is high on the agenda of PCCC Chairman Reed Hundt. **NEWS**, page 32

■ Users turn to companies such as IBM, Unisys and Digital for desktop and network support outsourcing services. **DESKTOP COMPUTING**, page 39

■ Intel pitches the P6 chip as the server platform for tomorrow. **WORKGROUP COMPUTING**, page 51

■ Increased functionality for less is at the core of 3Com's introduction of new Ethernet switches. **ENTERPRISE NETWORKING**, page 55

■ Digital announces five systems software areas

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for future development, leaving vertical market software up in the air. **LARGE SYSTEMS**, page 63

■ A new generation of object request brokers promises to unite diverse systems. **APPLICATION DEVELOPMENT**, page 69

■ In a study of IS ethics, nearly half of 255 IS professionals surveyed admit to copying commercial software without authorization. **IN DEPTH**, pages 1 and 101

■ Certification will never substitute for experience, but 65% of 243 IS managers say certified employees offer more value. **CAREERS**, page 106

■ Paul Gillin urges CIOs to restrain, not trash, their Cobol programmers. **VIEWPOINT**, page 36

■ Alan Alper says that even when the technology is in place, people issues can get in the way of client/server projects. **VIEWPOINT**, page 37

■ John Gantz predicts that Windows 95 will sell that the conversion will be a bear. **VIEWPOINT**, page 37

■ Charles Babcock notes that the futures of IS projects and Unix system vendor strategies are intertwined with those of the chip makers on which they depend. **COMMENTARY**, page 130

HOW LOW DO YOU GO? Computerworld visits a support group for unemployed IS managers and learns how tough it is to land a well-paying job.

MANAGEMENT, PAGE 79

YOU JUST DON'T GET IT! The CIO disconnect still dogs IS. But Verifone CIO Will Page and other executives reveal five ways to close the gap.

MANAGEMENT, PAGE 84

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May 19 Stock Ticker	Page 127
How to Contact Computerworld	Page 130

Executive Briefing

There may be a war brewing at Lockheed Martin Missile and Space, where some of its 9,100 Macintosh users are bracing to say "no way" to a proposal under which their Macs would be replaced by PCs running Microsoft's Windows 95. **Page 1**

On another front, U.S. defense officials warn that both military and commercial information systems are susceptible to attack during war. Enemies could supplement their weapons of death with electronic arms that shut down America's computers and communication networks. **Page 1**

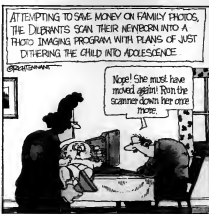
Outsourcing activity is shifting from operating data centers to supporting desktop and departmental computing. Users are demanding that outsourcing vendors, who may be traditional hardware providers, supplement hardware and software procurement with services such as help desk, management and strategic consulting. **Page 29. One company that turned to an outsourcer was Pennsylvania Power & Light**, which discovered it needed help and workgroup-level expertise midway through a distributed computing effort. **Page 52**

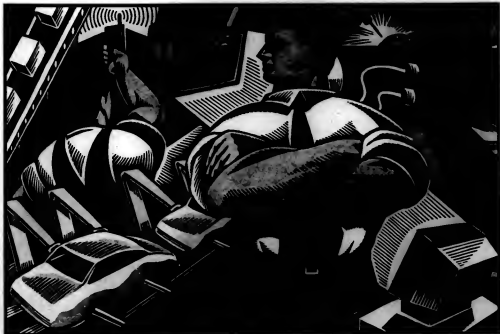
Chase Manhattan Bank's cost-cutting efforts are not expected to dramatically affect IS operations, given the bank's reliance on technology for competitive advantage. **Page 20**

Computer crime is taking some new twists, according to Scott Charney, the Justice Department's top prosecutor of such crimes. For example, as hackers grow older, they become profit-oriented, and people are abusing computers the way they did the telephone. IS will have to raise the bar on its security strategies, he says. **Page 56**

On site this week: Middleware technology, in the form of IBM's MQSeries asynchronous messaging software, is a core component of Kaiser Permanente's effort to create a single on-line pool of patient care data that can be accessed from any of the health plan's hospitals and medical offices. **Page 62. Desktop database technology** helps corporate customers of New Jersey's Public Service Electric & Gas trim their energy costs. **Page 70**

The 5th Wave by Rich Tennant





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BellSouth opens doors on bleeding-edge technology

Telco to make \$5 million investment in object-oriented training

By Julia Kling

The twin demons of cost-throat constrictions from alternative carriers and fierce customer demand for better service are pushing BellSouth Telecommunications, Inc. to technology's bleeding edge.

To keep from falling off, the Birmingham, Ala. telephone company will spend \$5 million over the next three years on object-oriented training for 500 information systems professionals, business managers and end users.

This highly unusual, multi-million-dollar training commitment is part of a much larger object-oriented strategy at BellSouth. Among other things, the company is replacing a massive, 20-year-old mainframe-based billing system under a four-year object development project known internally as Quantum.

Rolling out

So far, the company has completed the new system's presentation and usage modules. Following completion of a pilot test in Kentucky that began in December, the modules will roll out in Florida in July. Deployment to the rest of BellSouth's nine-state service area is slated for early next year.

Overall, the plan is to employ object technology as a "critical strategic lever," incorporating it into mainstream application development, said Norman Bunn, manager of BellSouth's object-oriented

resources center.

BellSouth is backing up such statements with big bucks.

"In terms of investment in training, it's the largest investment I've heard of," said Hugh Bishop, director of emerging technologies at Aberdeen Group in Boston. "Given the extreme shortage of professionals trained in object technology, it reflects a tremendous amount of foresight on BellSouth's part."

Today's lesson: Objects

The BellSouth object-oriented curriculum, which is being developed by AMS in partnership with Hewlett-Packard, Knowledge Systems and Parallax Systems, includes training in the following:

- Object and Smalltalk programming languages
- Object-oriented design and analysis
- Object-oriented programming languages
- Object-oriented databases
- Object-oriented systems architecture
- Object-oriented systems architecture
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- Object-oriented systems architecture
- Object-oriented systems architecture
- Object-oriented systems architecture

A team of about 60 BellSouth IS staffers in Birmingham and 140 consultants from American Management Systems, Inc. (AMS) in Fairfax, Va., completed the first modules in 15 months.

Both the presentation and usage modules are based on modified AMS software and include customized graphical user interfaces written in C++ and Smalltalk, according to Larry Cense, senior IS director.

Determining initial system requirements for the early modules involved combing through some 30 million lines of code embedded in the firm's proprietary customer record system. Complicating that process was a lack of documentation and the requirement that the new modules interface with at least 100 other BellSouth systems, Cense said.

BellSouth developed both modules with "a conglomeration of [object] methodologies" coupled with its internal systems development life cycle requirements, according to Rhonda Miller, chief architect on the billing system and manager of strategic systems development. The company has also widely deployed the Software Engineering Institute's development methods, she said.

Cense said one of the biggest problems was keeping the system up and running while it was being rewritten. "Given that we did all this in 15 months and then implemented in Kentucky with no problems is amazing," he added.

Fred Hamill, BellSouth's general manager of billing operations, and he was "pleasantly shocked." "I'm a user, and I'm always skeptical of technomazes, but both of these [modules] went into Kentucky without a hitch," Hamill said.

Compaq readies SMP, NT-based servers

By Jaikumar Vijayan

For some time now, Compaq Computer Corp. has been gunning for the heart of the database and application server marketplace. Today, it will roll out the first wave of heavy artillery.

The Houston-based PC maker is expected to unleash a line of high-end, Windows NT-based symmetrical multiprocessing (SMP) servers. The announcement comes at a time when other major vendors also are preparing to announce SMP systems based on Microsoft Corp.'s Windows NT. Their features will be aimed at allaying crucial user concerns over the ability of PC-based system architectures to scale further into low-end mainframe territory.

However, analysts cautioned that the turbocharged PC servers do not quite replace traditional midrange host systems yet.

Still, the Compaq systems are a significant step forward. The aggressively priced, quad-processor ProLiant 4500 systems (see chart) are based on Intel Corp.'s 100-MHz Pentium chip and are available in both rack-mounted and tower configurations. Among the features Compaq hopes will earn it wider attention from the glass houses are the following:

Higher performance, lower prices	
The ProLiant 4500 will cost the same as the ProLiant 2000	
Processors:	Up to four 100-MHz Pentiums
Memory:	Up to 16 byte for error checking and correcting
Cache:	512K bytes on each processor
Storage:	Up to 17.6-GB byte internal, up to 30GB byte external
Expansion:	14 total slots, including eight ISA
Price:	Starting at \$10,567

- Standby Recovery Server, which supports both Novell, Inc.'s NetWare and Windows NT. It is a SCSI board that basically switches networked users to a backup server automatically in the event of a primary system failure, addressing concerns about the reliability and availability of PC servers.
- Enhanced network and storage device controllers, for faster data transmission and higher speed I/O rates—other areas of user concern.

- Greater scalability through increased memory, internal expansion slots, larger-capacity storage bays and processor upgradability.

- Software support for Oracle Corp.'s Workgroup Server and Cherney Corp.'s Areserve for Windows NT—Compaq's server configuration and software installation tool.
- Prices that place it substantially below comparable systems.

With features such as these, Compaq "is giving buyers of traditional midrange systems a comfort zone," said Cheryl Currid, president of Currid and Co., a consultancy in Houston. "The message they are trying to convey to the data center is that this is not a toy PC flipped on its side."

Missing parts

But neither is it a full-fledged midrange system, analysts said.

While the systems represent top-of-the-class, high-performance PC servers, analysts said traditional midrange systems are typically far more scalable, have faster I/O and bus transmission rates, greater storage capacities and better communications features, and cost a whole lot more.

"The real key to minisuper-class performance is also the availability of a good industrial-strength, high-availability software environment. You can't take an NT system and compare it with an AS/400," however strong the hardware might be, said Mark Schaefer, director of network services at Fish and Richardson, a law firm in Boston.

Corrections

Due to an editing error, Dittp Wagle's name was misspelled ["Comdex Quips" CW, May 8]. Wagle is a Windows 95 product manager at Microsoft Corp.

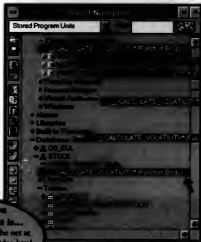
In "Client/server software heads for MVS territory" [CW, May 1], it was stated that Oracle Corp.'s full-blown client/server applications, scheduled to ship later this year, would support MVS. This refers to the upcoming Release 10.G, which has graphical user interface support.

Due to a reporting error, McKesson Corp. was mistakenly described as running a data warehouse on Tandem Computers, Inc. systems ["Unix databases handling larger loads" CW, May 8]. However, McKesson runs, and plans to keep, on-line transaction processing applications on Tandem.

In "ISDN costs may fall" [CW, May 15], Brian Miller was inadvertently quoted as Brian Taylor.

"Object-oriented financial package takes transactions" [CW, May 8] erred in indicating that Tower Technology Corp. was the lone provider of Eiffel object-oriented tools to Credit Agricole-Lazard Financial Products Ltd. (CALP). Tower provided CALP with Eiffel-based development tools, Interactive Software Engineering, Inc. in Goleta, Calif., provided CALP with a product called Interprete, which acts as an Eiffel compiler and Interpreter.

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High Performance Routing

IBM software goes beyond APPN networks

By Craig Stedman

IBM doesn't need a weatherman to tell which way the wind blows when it comes to network protocols.

And because the forecast calls for heavy use of TCP/IP—a longtime standard in the open systems world—the much-anticipated advanced routing software IBM will introduce today will not be tied too closely to its Advanced Peer-to-Peer Networking (APPN) architecture.

The High Performance Routing (HPR) software was primarily pitched as a new and improved version of APPN when IBM first discussed the technology more than

a year ago. However, IBM officials last week said HPR will get a multiprotocol send-off when plans for embedding it in the company's networking hardware and software are disclosed at an APPN technical conference in Chicago.

"Certainly HPR can be viewed as a better version of APPN," said Rick McGee, director of networking controllers at IBM's networking labs in Raleigh, N.C. "But we don't want to uniquely position HPR as an SNA-only thing." APPN is IBM's peer-to-peer rewrite of the venerable SNA host-to-terminal architecture.

The multiprotocol approach in HPR makes sense, users and analysts said, because many mainframe shops have segregated SNA in the data center and are choosing TCP/IP and LAN protocols over APPN as they put client/server applications in place.

Twice as nice

Gulf Insurance Group, a Dallas-based division of Travelers Insurance Co., is interested in APPN for its remaining 3270 terminal and mainframe printer traffic. But it has off-loaded most processing to an OS/2-based system that uses TCP/IP and the IPX protocol, which supports Novell, Inc.'s NetWare, said Glen White, senior vice president of information services at Gulf.

"I think we've got a pretty good handle on the rest of the piece"

with those two protocols, White said. "The OS/2 system is running fine, and I'm reluctant to tinker with it" to bring in APPN, he added.

HPR adds support for automatic rerouting around network failures and congestion control. Two features APPN has sorely lacked, it will first appear next month in a pair of APPN-oriented products: IBM's VTAM software for connecting 3270 terminals to mainframe applications and the network control software for its 3745 front-end processors.

But McGee and HPR will ship later this year on other products such as IBM's 2280 and 2217 multiprotocol routers and its AnyNet software, which allows users to interconnect various protocols. Those products support TCP/IP and LAN protocols in addition to APPN and SNA.

Chemical Banking Corp. in New York plans to migrate its SNA networks to APPN over time, and HPR finally makes that feasible, said Al Candela, a vice president in the bank's corporate telecommunications planning department. APPN was "pretty embryonic" without the automatic rerouting and congestion control capabilities, according to Can-

Appropriate protocol?

APPN with High Performance Routing has the following pluses and minuses compared with TCP/IP, according to industry analysts

- ▶ APPN uses wide-area network bandwidth more efficiently, reducing data transmission costs.
- ▶ A proactive congestion control feature lets APPN users adjust traffic flow before problems occur.
- ▶ Directory of APPN network modes can be updated automatically when changes are made.
- ▶ Capital equipment, network design and management costs are higher for APPN than for TCP/IP.
- ▶ APPN uses more network overhead when setting up sessions, increasing start-up times.
- ▶ TCP/IP is supported by many networking and application vendors.

Acronyms swirl

APPC—Advanced Program-to-Program Communications. Application programming interface for connecting clients and servers via multiple network protocols.

APPN—Advanced Peer-to-Peer Networking. Follow-on protocol to SNA with support for peer-to-peer routing rather than a host-centric approach.

HPR—High Performance Routing. New software with advanced routing and congestion control features for APPN. Will also support other protocols.

VTAM—Virtual Telecommunications Access Method. Mainframe software that connects applications to SNA or APPN networks.

dela. "Those are real important."

However, Chemical Bank also relies heavily on TCP/IP for its nonmainframe operations such as a multiprotocol network that links LANs in its back-office operations. "Both APPN and TCP/IP will be major protocols in our networks for quite some time," Candela said.

"Technically, APPN has a whole lot of advantages over TCP/IP," said Louise Herndon Wells, a director at the Internet Technology Institute consultancy in Millis, Calif. "But people often make decisions for reasons other than technology." TCP/IP has wider vendor support and more momentum, she added.

Close reveals plans for adding APPN to its routers. See page 56.

Vendors flood road to NT with new systems

By Neal Weinberg and Jalkarna Vijayan

An increasing number of hardware vendors are hitching their wagons to Windows NT, hoping to ride Microsoft Corp.'s operating system as it chases Unix across the enterprise.

Compu Computer Corp., NEC Technologies, Inc., AT&T Global Information Solutions and Zenith Data Systems are all coming out with NT-based systems aimed at the database and application server market.

Because NT is not considered an industrial-strength system, vendors are trying to ease users slowly up the food chain, said Dan Kusnetzky, an analyst at International Data Corp. in Framingham, Mass. "The idea is to capture one server [market] at a time, build an enterprise track record and then go after the big applications," he said.

Ted Julian, editor of "The Gray Sheet," an industry newsletter in Framingham, Mass.,

said it will take a few more years before interest in NT translates into significant application server sales.

"People don't change [application] server architectures overnight. It's one thing to say you are creating an NT-based Web server and another entirely to say that you are moving mission-critical applications to NT," he said.

In its infancy

Mark Schwartz, director of network services at Fish and Richardson in Boston, said he is also wary. "NT is still embryonic," he said. It does not have the same distributed management and communications capabilities as Unix, and it does not scale in clustered and massively parallel systems, he said.

Nevertheless, some users are already taking the plunge. The Michigan Livestock Exchange, an East Lansing-based cooperative of livestock growers, recently switched from two Texas

Instruments, Inc. minicomputers to distributed processing based on Windows NT.

Bill Graves, an information technology consultant for the organization, said NT is simple to install and maintain, inexpensive and runs smoothly with all the PCs in the office.

"Dany Levy, director of product marketing at NEC, said, "We think that NT is ready for prime time at the workgroup and departmental levels. It is where Unix was 12 years ago—ready to explode."

Mountain View, Calif.-based NEC last week announced a four-processor, RISC-based, Windows NT server that will target two specific user bases—those upgrading from legacy LAN

environments such as Novell, Inc.'s NetWare and Banyan Systems, Inc.'s Vines and those downsizing from VAX/VMS and AS/400 environments.

Not to be outflanked, Digital Equipment Corp. in Maynard, Mass., recently announced

Server software directions

- Shipments of Windows NT servers will overtake shipments of Unix servers first by 1995.
- Intel-based systems will account for more than 90% of Windows NT servers through 1995.
- Unix will be considered a mainstream, data-center operating system by 1998.
- Overcoming of shrink-wrapped server operating systems will lead to market consolidation on the two operating systems by 1998.

Source: Gartner Group, Inc., Stamford, Conn.

plans to deliver Windows NT to the enterprise for its VAX/VMS installed base. Recognizing that third-party applications were being written for Windows NT but not for VMS, Digital said it will develop the tools so that NT-

based applications will also run on VMS.

Digital is telling its VMS users to run Windows NT for business applications with VMS continuing to act as the back-end server.

Monte Rector, senior business manager of systems marketing at Compu, said NT is gaining momentum. "There is growing interest in our user base to have a common [operating system] interface from the desktop to the application server," he said.

Like NEC, Compu in Houston this week will announce a high-end, NT-based, PC server.

And AT&T GIS in Dayton, Ohio, which will announce a quad-processor NT server platform later this month, is seeing the beginning of an NT surge, said Martin Simoni, director Windows NT marketing.

"We have been pleasantly surprised by the number of customers willing to commit mission-critical applications to NT servers," he said.

Digital's VAX users heave sigh of relief

By Neal Weinberg

In a nod to its vast VAX customer base, Digital Equipment Corp. has brought its OpenVMS operating system for VAX hardware to virtual parity with its Alpha version.

Release 6.2 of OpenVMS will be available in early June with enough bells and whistles to satisfy the 10 million concerned members of the VAX user base, who have complained that in prior releases the Alpha version got the latest features first.

"It looks like a nice little catch-up upgrade," said Brian Raffner, VAX systems manager at Lubrizol Corp. in Painesville, Ohio. He said he was especially interested in the new feature that allows simplified PC management across multiple clusters.

OpenVMS 6.2 in a nutshell

- Support for SCSI clusters
- PC-based management station
- Firmware CD-ROM
- TCP/IP does not require DECnet
- Improved Internet support

Because his company is not ready to move to Alpha-based hardware, Raffner said he was pleased that Digital engineers were working to keep the VAX version current with its Alpha cousin.

VAX users had been concerned that Digital was deliberately putting more emphasis on the Alpha side to ouster customers toward the new hardware. But Digital's recent announcement that it wants to slowly migrate its OpenVMS customers to Microsoft Corp.'s Windows NT was accompanied by a pledge to continue VAX-side software enhancements in the near term.

Raffner said he was hoping Digital would provide a new file system in Version 6.2, but Digital officials now say that feature will be available by year's end.

Right direction

"I think it's a good move," said Al Phillips, supervisor of systems services at Dresser Industries, Inc. in Salisbury, Md. "It's a nice piece of software, and it moves them in the right direction — into the networking world."

OpenVMS 6.2 has features that make it easier to use the TCP/IP networking protocol as well.

"I'm glad to see it for the installed base," Phillips added. "It gives them some credibility and reassures people they don't have any super need to move off that architecture."

However, Phillips said he is not ready to buy 6.2. "It doesn't deliver anything to me based on the way my center runs." He said he plans to wait at least six months before making a purchasing decision.

Ray K. Lozano, engineering systems supervisor at High Steel Structures, Inc. in Lancaster, Pa., said he is interested in

the new feature that allows users to store and recall large numbers of commands.

Other VAX users find they are perfectly content to run prior releases of OpenVMS, all the way back to 5.5, which was first released in 1991. Julie Beck, computer operations analyst at the California Exposition and State Fair in Sacra-

mento, has a VAX running VMS 5.5. She said she is not in the market for an upgrade.

Keith Brandt, computer services manager at Fowl Manufacturing Co. in Foley, Ala., also uses VMS 5.5 and is not itching to trade up. "It performs what it's got to do," he said.

While Digital officials have pledged to continue upgrading OpenVMS for VAX, they emphasized at the recent Digital Equipment Computer Users Society conference that parity will not last much longer. New features that take advantage of Alpha's 64-bit capabilities will be available only on that version.



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Sybase debuts database access option

By Patrick Dryden
DALLAS

Sybase, Inc. unveiled a middleware option last week that enables the client and server parts of its database architecture to handle messages as well as session connections.

Both access methods are vital to extending client/server applications across enterprise networks, officials told attendees at the international user group conference here.

Desktop users still connect to their servers in real-time sessions under network control, but an increasing number of mobile users connect intermittently — by modem, radio or other remote link. They need a system to convert their interaction with servers into a series of messages that can be stored, forwarded and safeguarded whenever they choose to connect.

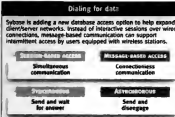
Middle-tier replacement

The mature Enterprise Messaging Services (EMS) technology was developed by CompuLink Architectures and acquired in February. Sybase now offers EMS components that are not restricted to its own products, but it plans to integrate EMS message management next year as an access option for its Open Client and Open Server.

One attendee was eager to try EMS because almost every access to his firm's da-

tabase for managing prescription benefits comes via modem.

"Our Open Server does background processing so remote users don't have to stay connected," said Mahesh Patel, senior programmer/analyst at Medco Containment Services in Woodcliff Lake, N.J. "With EMS, we could replace our middle-tier application with messaging."



EMS frees corporate and commercial programmers from having to manage the underlying complexities of network communications. Its event manager handles routing and queuing, its communications manager formats queued data into packets, and its communications agent deals with the low-level connection details.

Because remote users could have diverse tasks and their connection bandwidth may vary, EMS lets applications set priorities and request quality of service. For example, such steps can expedite the ex-

change of important electronic mail and prevent bulk file transfers via expensive satellite links.

The small size of EMS — 120K to 160K bytes — fits portable computers and DOS-based personal digital assistants the mobile users. And EMS could add traditional session-based exchanges over wired networks by ensuring that messages are not lost when a system or a network link fails.

"At a very basic level, EMS could help us prioritize requests to deliver some queries that users don't need immediately," said Joy Mundy, decision support systems analyst at Stanford University. "With 2,000 to 3,000 simultaneous users, we can't always get answers back right away."

About half of Sybase users need to support mobile applications, according to Bob Epstein, co-founder and executive vice president of Emeryville, Calif.-based Sybase. "Not everyone needs messaging yet, but eventually they will."

Within two years, message-based interaction will be the mainstream environment for users and for devices such as cable television interfaces and utility meters, Epstein said.

But few attendees cited any pressing need to add a layer for message-based access management. Some described such messaging as "too far off, not relevant to me now" and "just another access method to learn."

Fewer bugs for System 11

Sybase tried to assure users last week that System 11 will ship in the fourth quarter with fewer bugs, better performance and more scalability than the current version.

Almost three-fourths of the customers surveyed by Sybase had upgraded to System 10 in March, up from half in December, the company said.

Improvements to System 11 include a logical memory manager to boost I/O, tunable block size to optimize access with mixed workloads and data partitioning to enable parallel loads and concurrent inserts, said Dennis McEvoy, Sybase's vice president of products.

The new version has slipped 30 to 40 days, McEvoy said. But he promised that the wait will be worthwhile.

McEvoy said he expects to begin beta testing for System 11 early in the third quarter. — Patrick Dryden

News Shorts

IS retains control over tech procurement

Reports that information systems organizations have lost centralized control over technology procurements have been greatly exaggerated, according to two recent reports surveying more than 500 top IS executives. The surveys, conducted by the Society for Information Management, show that IS acquisition groups at 81% of U.S. companies still report to IS. In one of the surveys, 77% of the IS executives polled said their organizations are responsible for developing procurement strategies for distributed computing assets.

Last Tango for porn surfers?

SurfWatch Software, Inc. in Los Altos, Calif., made a splash last week by announcing the first-ever PC software that blocks users from accessing pornographic sites on the Internet. Originally intended for use by families and schools, the software will also be sold to corporations. "We're getting a lot of calls from corporations" who want to curb porno-surfing by employees, said company President Alan Duvall. The PC software retails for \$49.95, plus a \$5.95 monthly fee for updates. Corporate site licenses are possible, Duvall said.

Microsoft, Novell bury hatchet

Users who have perennially been caught in the cross fire of vendor finger-

pointing should be relieved about a new joint support pact between two of the most influential desk-

top software vendors, Novell, Inc. and Microsoft Corp. Last week, the two companies agreed to take an on-line tack to solving user support complaints and mutually supporting each other's products. Specifically, the two firms said they will co-author technical documentation, co-sponsor support forums and cross train each other's support engineers.

DMV overhaul slammed

The California Department of Motor Vehicles, which conceded last year that its \$44 million computer overhaul

was a bust, last week released a consultant's report that urges the agency to scrap or sell its 12-year-old Thendex Computers, Inc. system. The Warner Group in Woodland Hills, Calif., recommended the Sacramento-based agency undertake a re-engineering effort to define its business needs, convert existing IBM mainframe databases to standard format and replace aging IBM Series/1 computers at its field offices. The California legislature is expected to hold hearings on further computer funding for the DMV this summer.

Sybase, Compaq team up

Seizing an opportunity to recover from the last quarter's dismal performance, Sybase, Inc. expanded its partnership with LAN server leader Compaq Computer Corp. last week. The two companies will develop, market and support client/server configurations based on Microsoft's Windows NT. The Santa Cruz Operation's SCO Unix and Novell's NetWare and UnixWare. "Last quarter, 40% of our total business came from those PC platforms," said Bob Epstein, executive vice president of Sybase. According to the companies, Compaq will include Sybase database software in its SmartStart CD-ROM kit to simplify setup of application servers.

SHORT TAKES Hewlett-Packard Co. in Palo Alto, Calif., today will announce price cuts of up to 20% on its OmniBook 4000 notebooks. A new model equipped with a 25-MHz 486DX2 chip, a 200-Mbyte hard drive, built-in sound and a 10.3-in. passive-matrix color screen now costs \$2,418. U.S. companies will spend \$81 billion this year on IS projects that will never be completed, according to a study by The Standish Group International, Inc. in Dennis, Mass., market research firm. Olivetti North America in Liberty Lake, Wash., last week entered the help desk services market, announcing it will offer a full range of computer hardware and office productivity services through several U.S.-based technology competency centers. ... Jim Abrahamson said last week he will retire on June 1 as chairman at Oracle Corp., relinquishing his post to President and Chief Executive Officer Larry Ellison. ... Storage Technology Corp. in Littleton, Colo., signed a letter of intent to sell the lease assets of its midrange and open systems storage division to AT&T Capital Corp. ... Jerry S. Benson Jr. will become president and chief operating officer of NEC Technologies Inc. in Buxton, Mass. He takes over from James R. Barrett, who will retire this summer. Kenjo Nitta will remain chairman and CEO.



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Users doubt client/server shortcuts

By Rosemary Callahan

An increasing number of client/server implementation tools and methodologies that claim to slice project time by as much as half are hitting the market.

Avantia Software, Inc., for example, last week launched Atlas, an application

implementation tool that it claims "enables companies to reduce [client/server] implementation time by up to 50%."

Atlas is intended to help users model business processes as well as provide on-line documentation and training aids. The company cannot yet prove that Atlas cuts implementation time so drastically

but is relying on customer estimates and internal tests to back up its claim.

Yet users continue to say that there still is no quick and dirty fix for client/server, and some customers said these kinds of time-savings claims miss the point. While the products may save time, the real objective is to find a tool set that

will help users better manage projects.

"I don't think there are shortcuts. If you take them, they could end up biting you in the end," said Todd Molbeck, a project manager at Leeson Electric Motors in Grafton, Wis., who is installing Oracle Corp. applications.

Molbeck is one of the first users of Redwood Shores, Calif.-based Oracle's Aim Advantage implementation methodology and tool set, which shipped in April.

Also, K/S Deloitte in Chadds Ford, Pa., rolled out its implementation package in March. Aimed exclusively at the SAP AG R/3 market, FastTrack 4 SAP claims to cut project times by 25% to 50%.

Tim McCammon, methods and procedures manager at Zimmer, Inc. in Warsaw, Ind., said he plans to license the Atlas tool set because it will help him do a better job on his project — not because of the time-savings claims.

"I don't know if their 50% statement is true," McCammon said. "We are planning to provide better assistance for training. I would say it [will make the project] more efficient. I can't say if there are shortcuts."

Molbeck also said he expects Aim Advantage to help do higher quality work.

"It gives you a good look at what you have to consider when you come up with a project plan," Molbeck said. "Management is in tune with how long a project will take. What they don't like is if I say it will take 12 months and then go back to them and say, 'Oops, we need another four.' I can't afford to make bad judgments."

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 Users turn to new development tools for client/server apps. See page 93.

Unbundled is better

Prepackaged client/server application bundles — touted as an efficient and easier approach to client/server computing — are shaping up as a bunch of fads. The not-so-pretty update includes the following:

- Oracle, which jointly announced Quickstart last year with SRL Systemhouse, Inc., last week said the prepackaged bundle was really a Systemhouse program and declined further comment. Quickstart, which would include Oracle applications and Systemhouse services, costs \$400,000.

- Walker Interactive Systems, Inc. in San Francisco last week said it had shipped one Quickstart package since rolling out the bundle in January. Quickstart costs \$75,000 to \$335,000, depending on the number of software modules.

- SAP America, Inc. President Klaus Bester confirmed that its Special Delivery package went nowhere fast in the U.S. Analysts estimated that a handful of the \$500,000 packages were sold.

— Rosemary Callahan

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Bay's first offering targets service needs

By Michael Fitzgerald and Laura DiNo
SILVERDA, MASS

Bay Networks, Inc. seems to have made it through its first seven months of life more smoothly than most merged technology companies. Now it has to prove it can ship products.

So why is its first new "product" a service plan? "Service is something being demanded by customers," said Gary Bowen, Bay Networks' executive vice president of field operations and marketing. Indeed, a March survey of 250 information systems managers by International Data Corp. (IDC) indicated that technical support was the single most important factor consid-

ered by Internet-networking customers. It scored 4.38 out of a possible 5 points in importance.

Stated to be announced next Tuesday, the Bay Networks Service plan features four groups: Professional Services, Education Services, Maintenance Services and Information Services—as well as the following main features:

- Full 24-hour, seven-day-a-week worldwide service.
- A consolidated training program, with locations worldwide.
- Professional consulting services.
- On-site service provided by IBM.

In June or July, Bay plans to launch its Remote Network Monitoring Center. In beta testing now, the center will proactively monitor networks to gauge when one might go down and handle remote troubleshooting.

"We will move from a fix-it service like [the one] that American carriers had to the 'customer delight' service of a BMW or Mercedes," Bowen said.

Bay plans to devote as much as 50% of its support budget to worldwide technical support.

Customer service often suffers after a merger, but a *Computerworld* survey shows that the new company, formed from the merger of Wellfleet Communications, Inc. and SynOptics Communications, Inc., appears to have successfully dodged this bullet (see chart).

Longtime Wellfleet router customers such as Mark Herder, a network support specialist at Dartmouth Hitchcock Medical Center in Lebanon, N.H., concurred.

"Our greatest fear in the post-merger era was that support for Bay's Wellfleet routers would decline, and

Some things never change

How would you describe support for Bay products since the Wellfleet/SynOptics merger?



Source: Computerworld survey

but hasn't happened," Herder said.

However, users are voting complaints at sites where former Wellfleet technicians find themselves servicing SynOptics hubs that incorporate rival Cisco Systems, Inc. routers.

"It's been a real comedy of errors watching the former Wellfleet technicians trying to fix problems in Cisco routing modules. The fixes take more time to solve since Cisco isn't about to provide details about its routing code to its No. 1 competitor," lamented one network administrator at a New York-based financial institution.

Now that the restructuring is done, "we have to execute on products," said Paul Severino, Bay's chairman. Analysts said Bay has to prove it can deliver products.

"We haven't seen any integration of product strategies yet," said John De-

Pietro, an analyst at IDC. He cited a lack of integration in Bay's product line—for instance, the need to build its Optimity management software across product lines or incorporate frame-switching technology into its Bay-Sis architectural strategy.

But Bay officials pointed to a number of other products due to ship this year, some of them designed to integrate technologies. They include the following:

- The D5000, a version of the 5000 family of routers that provides switched 10M and 100M bit/sec. Ethernet.
- The Access Stack Node.
- LightShare, a next-generation combined hub/router.
- Bay-Sis will now include Centillion Networks, Inc.'s SpeedSwitch 100.

But analysts have said they never expected Bay to ship new products until the second half of the year.

Execution is key

Bay's product execution will be the subject of intense scrutiny. Delivery is especially crucial in light of lengthy delays in legacy equipment such as the former SynOptics' 25000 family of switches, which began shipping to selected customers early this year—more than six months behind schedule.

Production on the 25000 family is now ramping up, and Bay is whittling away its backlog, which currently stands at four to six weeks in the U.S. and is worse in Europe. Still, the 25000 family will not become generally available in the U.S. until July or August, according to Andrew Ludwig, Bay Networks' president and chief executive officer.

—Laura DiNo and Mike Fitzgerald

Banyan's Redwood plan: All forest, no trees

By Laura DiNo
WESTBORO, MASS

Long on vision, short on specifics.

That is what analysts and users said about Banyan Systems, Inc.'s three-year, phased Redwood strategy to extend its Enterprise Network Services and StreetTalk directory services to enhance mobile and remote users and electronic commerce technology.

Redwood builds upon Banyan's core competency in directory services, even as the company unsheds those services and charts a course that is increasingly separate from its Vines network operating system business.

Stored information

A directory service stores network items such as users' names, locations, security access rights and other descriptive information in a distributed database. The information is then replicated throughout the StreetTalk global directory. So users only have to log on once to access resources—regardless of their location on the network.

The first tangible by-product of the Redwood strategy will be a new Internet business directory initiative that is

based on the StreetTalk global directory. Banyan aims to have the Internet directory product commercially available in the next six months, according to John Paul, Banyan's senior vice president of product and business development.

The directory would enable users to create business forms and automate routine tasks such as information searches on a variety of subjects ranging from Yellow Pages and White Pages telephone directory listings to extensive databases, Paul said.

This type of Internet directory would compete with similar joint initiatives already under way from AT&T Corp. and Lotus Development Corp., according to Tim Sloane, director of messaging applications and services at Aberdeen Group in Boston.

Banyan is shopping around for a business partner from the ranks of carrier providers and the regional bell operating companies, Paul said.

The Redwood strategy consists of three software components: Click to Information, Business on Mail and Self-Managing Networks (see chart).

These unbundled components will accommodate multivendor and multiprotocol environments. They will run indepen-

dently of the hardware or network operating system platform. Click to Information, for example, will provide customers with a flexible framework to easily locate, store and manage network resources among corporate, remote and mobile users as well as corporations and their customers, according to Paul.

Appears doubtful

Sloane said Banyan's claims that Redwood will allow it to dominate three specific markets "strains credibility in the point of disbelief."

"Unfortunately, established players with much larger revenue than Banyan have already carved out dominant niches for themselves," Sloane said.

"David without a slingshot would have a better chance of felling Goliath than Banyan has of displacing Novell, AT&T, IBM, Lotus and others in those markets," he said.

Even loyalist Banyan users such as Martin Smith, director of information services at the International Trade Commission in Washington, conceded the

Looming on the horizon

BANYAN'S REDWOOD STRATEGY:

- 1. **Click to Information:** Will be based on StreetTalk directory services; designed to make it easy for end users to find, share and secure information and resources almost instantaneously.
- 2. **Business on Mail:** Will use BeyondMail as the foundation to allow customers to build line-of-business and workflow applications that run on store-and-forward messaging.
- 3. **Self-Managing Networks:** Will use the Distributed Management Architecture as the core facility to automate common network management tasks and manage the enterprise with minimal support staff.

company faces an uphill battle in wooing new customers and third-party software developers into the Redwood forest.

"It's tough being a \$150 million company trying to swim in the same lake with billion-dollar firms," Smith said.

Banyan's Vines builds client ties with Windows desktops. See page 51.

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Sun seeks to shield servers

SunScreen security tool kicks off entry into electronic commerce sector

By Jean S. Huzman
SAN FRANCISCO CALIF.

In a bid to become a major player in Internet electronic commerce, Sun Microsystems, Inc. this week will announce an Internet security system to protect servers at corporate sites.

The new product, SunScreen, combines a small 32m server and encryption software to check all incoming network requests. To foil intruders, it has a "silent sentry" profile, which means it does not broadcast its own network TCP/IP address.

Industry analysts said Sun's move would bolster the concept of using the Internet to bridge a corporation's head-quarters and its remote sites.

"The real future of firewalls is going to

be in use them internally to enforce separation and isolation in the internal corporate network," said Robert Campbell, chief executive officer of Unisys Information Management, Inc., a security work security company in Woodbridge, Va. Each Internet link would replace more costly dedicated T1 leased lines from major telephone companies, he said.

Using SunScreen servers at either end of the Internet link creates a Virtual Secure Private Network, Sun officials said. SunScreen costs \$50,000 to \$100,000, but it is the first in a series of server products with varying security ratings, according to Carl Stolle, director of Sun's server

product marketing.

Other key features include encryption, support for public and private key security software, packet filtering and a built-in firewall. Sun is proposing its new

Simple Key Management for Internet Protocol as an industry standard to the Internet Engineering Task Force in Cambridge, Mass.

SunScreen is part of a wide-ranging Sun Internet announcement this week that includes the Hot Java Internet browser (J.W. May 15) and new Netscape Internet servers. The Netscape servers will use Novell, Inc. NetWare networking protocols to support Windows and Macintosh clients, along with Unix clients.



Banks align to cooperate on object-oriented development

By Elizabeth Heicher

Intense competition in the financial services industry pushes many banks to the leading edge in implementing object-oriented technologies designed to provide a leg up on their rivals.

However, some banks that are clients of Westport, Conn.-based consulting firm Atelier Research — including Citibank, Bankers Trust and JP Morgan — are exploring the notion that there is room for close cooperation in areas that do not provide much competitive advantage.

Common bonds

Atelier's banking industry clients plan to meet in late June to discuss their common requirements for a business object model to support banking systems development. The group's objective is to see whether it is feasible to develop a generic banking object model, which can then be used as a common framework to be customized by each participating company.

If software vendors or systems integrators can be persuaded to produce and maintain a basic object model for common processes that all the banks use, then the banks could devote their own resources to developing the differentiating technologies and products that add value to their businesses, said Adrian Bowler, Atelier's managing director.

James said as what kind of object technology model or applications frameworks will be chosen remain open, he added.

Net management, Web-style

Web server software embedded in Tribe's branch-office router lets remote administrators browse to check a device's status, change configurations and get help by scanning an on-line manual or linking to vendors.

Approved users can check setup, run diagnostics and track activity.

A manual and hot-links to the vendor's support services provide advice and updates. Users can forward status pages across the Internet for more help.

Tribe's WebManage enables remote fixes

By Patrick Dryden

Add network management to the growing list of practical uses for the World Wide Web, the friendly face on the expanding Internet.

Tribe Computer Works is introducing technology called WebManage this week that bypasses cryptic commands and complex consoles reserved for management experts. Anyone equipped with browser software can peek at the status of a device across the Internet and jump in a vendor's home page for fixes or software updates.

Help on the way

This new use of Web technology could help those in the trenches — the salespeople, clerical staff and others in small offices — who must manage small routers in growing networks, said Michael Howard, president of Inhaetics Research, Inc., a San Jose, Calif., Internet-

working and management consultancy.

"It sounds like a novelty today, but no-gurus will be managing the networks," he said. "You've got to take away some of their fear with a familiar interface and links to the information repositories already provided in the 'net by Cisco Systems, Bay Networks and others for troubleshooting problems and solutions."

Browser-based management technology can extend to all kinds of networking products, from the routers, switches and remote access servers that make up the Internet to future "network appliances," such as home communication systems, said Gordon Ritter, president of Alameda, Calif.-based Tribe.

WebManage comes with TribeLink2, a two-port router and remote access server for branch offices that ships next month for \$1,295. Tribe will offer the core HyperText Network Management Platform royalty-free to the entire marketplace, Ritter said.

Microsoft, NBC go on-line together



"[This] will allow both our companies to bring more value to consumers on both platforms."

Bill Gates, chairman and CEO, Microsoft



"[We] will be able to produce new media products that have enormous content and market advantages."

Bob Wright, president and CEO, NBC

By Ellis Bunker

Microsoft Corp. and NBC last week joined forces to develop and market a broad line of multimedia products, from on-line services to CD-ROM and interactive TV products.

Microsoft Chairman Bill Gates said the intensive relationship reaches beyond NBC's participation in Microsoft's forthcoming on-line service, The Microsoft Network. Gates said Microsoft would provide tools to help NBC cost-effectively pitch its entertainment and news content for digital venues.

NBC President Bob Wright also announced his company would phase out involvement in Prodigy and America Online in favor of The Microsoft Network, which is scheduled to go live in August in conjunction with the release of Windows 95.

Financial details of the digital media alliance were not released. The deal follows by two weeks MCI Communications Corp.'s agreement to invest up to \$2 billion in Rupert Murdoch's News Corp.

Cheyenne heads for Unix territory

Revamps backup, storage management products

By Steve Moore

■ Cheyenne Software, Inc. in Roslyn Heights, N.Y., last week marched into the Unix arena armed with new relationships and products to broaden the enterprise appeal of its backup and storage management products.

Beset by a series of bugs to the three most recent versions of its ARCserve for NetWare backup software, Cheyenne claims to have fixed those problems and now hopes to shift the industry's attention to its Unix market push.

Unix storage lineup

Cheyenne Hierarchical Storage Manager
for Unix migrates data between disks and optical disk libraries

ARCserve/Open backup system supports HP-UX 9000, IBM AIX 4.1, SunOS 4.1.3 and Solaris 2.3 servers and clients

Agent software runs on Oracle 6.x and 7.x databases

Cheyenne repackaged the NetStore Unix hierarchical storage management product from Zetaco in Burnsville, Minn., a recent Cheyenne acquisition, as the Cheyenne Hierarchical Storage Manager for Unix. The vendor also expanded the Unix platform support in its ARCserve/Open Unix-oriented backup package (see chart).

Up against rivals

Supporting a broader range of open system clients and platforms in ARCserve "gives Cheyenne a comparable enterprise solution to Legato and Openvision Technologies, Inc.," said Michael Peterson, president of Strategic Research Corp. in Santa Barbara, Calif.

Because 60% of Unix environments are linked to PC LANs, "in many cases you'll want to pull PC data up to a Unix backup server because Unix is more reliable and robust than NetWare or NT," Peterson said.

Users in Unix shops applauded the level of automation in Cheyenne's Unix-oriented hierarchical storage management and backup products.

"If I handed off [manual] backup and restore tasks to other users who are not as familiar with Unix as I am, they would have a hard time," said Steve Yamamoto, a software engineer at MCI Communications Corp.'s enhanced voice services group in San Francisco. Automated tools such as Cheyenne's will enable him to "eventually get rid of my backup duties and give them to someone else," he said.

Another user said Cheyenne's hierarchical storage management software makes it possible to quickly rectify disk drive errors. "We can force all the files off-line to optical [storage], replace the drive and then tell [the software] to re-

build the drive and quickly get back to where we started," said Tom Hoyle, a systems administrator at Rosemount Aerospace, Inc. in Burnsville, Minn.

However, he added, "One missing piece I would like to see is some way for

their software in better track files that you take off-line, so it tells you which tape a file is on."

Cheyenne also announced partnerships with Escalade Corp. and SAP AG. Escalade will bundle ARCserve/Open for SunSoft, Inc.'s Solaris with its Esh-100 half-height 8mm tape library, and SAP

will use ARCserve for Microsoft Corp.'s Windows NT to provide data protection for users of its R/3 applications.

In addition, The Santa Cruz Operation in Santa Cruz, Calif., announced it intends to bundle Cheyenne's ARCserve/Open backup software with its SCO OpenServer operating system.

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Remote dial-up switching

Internet alliance offers connection

By Mindy Blodgett and Michael Fitzgerald

Don't look now, but Northern Telecom, Inc. and Shiva Corp. are trying to sneak one more technology onto users' plates: remote dial-up switching to the Internet.

The two companies said this new product category is simply a larger version of the remote access server, which already enables companies to connect remote and mobile workers to their corporate information infrastructure.



If this alliance works, users will benefit, analysts said.

"This agreement could lead to user firms outsourcing [remote access operations] to carriers," said David Goodtree, an analyst at Forrester Research, Inc. in Cambridge, Mass. He said one-stop shopping for T1-class data transport rates, network management and billing is attractive to users, who today "have to do it on their own."

Users could also handle six times as many phone calls and connect to multiple LANs and hostilities at once, he added.

The broad-based alliance between Shiva, a maker of remote access products in Burlington, Mass., and Northern Telecom, a carrier and equipment maker in Mississauga, Ontario, covers software and technology development, support, sales and marketing. When the first products are ready sometime in the fourth quarter, they will target carriers, Internet service providers, user service companies.

Nothing flew yet. Still, the two offered little more than vision, and right now,

one needs trifocals to see it clearly. This is one reason why potential customers such as AT&T Corp. and MCI Communications Corp. held little to say about the alliance.

"Until we've seen the technical specifications and tested it out, it's hard for us to comment or speculate on what it might do," said an AT&T spokeswoman in Basking Ridge, N.J. Analysts said the fourth-quarter delivery date is probably overly optimistic.

Nonetheless, Nick Lippis, an analyst at Strategic Networks Consulting in Rockland, Mass., called the agreement "a fascinating alliance."

"It will offer the carriers a way in which they can offer both telecommunications-type service as well as Internet access," Lippis said.

Info warfare risk grows

CONTINUED FROM PAGE 1

traffic control systems, power grids and Federal Reserve System networks would be targets of choice for "info-assaults" (see box).

"Anyone could be the target of attack," agreed U.S. Navy Adm. William O. Studeman, deputy director of the Central Intelligence Agency. "There is so much momentum on the risk side that there is a fair amount of urgency on this."

Military officials acknowledged that the security of information systems has only recently become a high-priority item.

"The situation we find ourselves in with systems [in the Defense Department] is the result of 15 to 20 years of neglect," Paug said. "We can accurately call them 'open systems,' meaning they are open to anyone who has a desire to get into them."

Paug said defense and intelligence agencies will launch an exercise on June 3 to explore the threats from information warfare. "It's a war game using Iran as the bad guy getting into our systems," he explained.

War games

Intelligence experts said the Pentagon's offensive weapons may include electromagnetic pulse guns and "sneeper" computer viruses that can be triggered remotely or by code. The list may also include rogue software that could, for example, send false alerts to an enemy or scramble its logistics systems.

"There's the potential for major breakthroughs in the conduct of war based on information technology," said Gen. Ronald R. Fugleman, U.S. Air Force chief of staff. "In the fa-



"The situation we find ourselves in with systems [in the Defense Department] is the result of 15 to 20 years of neglect."

— Emmet Paug Jr., Assistant secretary of defense

Military ignores corporate IS

The U.S. military is virtually ignoring the commercial systems on which it depends, according to Winn Schwartz, author of *Information Warfare—Chaos on the Information Highway*.

"Wall Street and others in nondefense industries are crucial economic assets of the U.S., and we need to incorporate a means for their defense in an overall policy," Schwartz said. "Right now, the private sector is sitting there all alone, and the weapons coming our way today are more sophisticated than a couple of guys writing viruses in Bulgaria."

Schwartz is calling for the development of a national information policy that would answer questions such as "Are industrial secrets the equivalent of military secrets?" or "Should U.S. agencies spy on foreign corporations?"

Intelligence expert Robert D. Steele said the National Security Agency (NSA) should drastically mesh of what it knows about threats to commercial systems.

"The NSA knows who is stealing our electronic secrets over the Internet, who is capturing [electronic] net/jam emissions from company headquarters and who is setting up telephone intercepts in the U.S.," he said. —Garry H. Ankles



the product of centuries of conventional warfare so bringing it into the digital age will not be easy, officials noted.

PCAnywhere gains additional security

By Mindy Blodgett

Symantec Corp.'s popular Norton PCAnywhere access server has been updated to include extra mobile user enhancements, additional security features that ease remote network administration.

The Cupertino, Calif., company said the OS/2-based Norton PCAnywhere Access Server 2.0 offers access to network applications and data in part by supporting Novell, Inc. NetWare-encrypted passwords. It also lets network administrators remotely recognize and monitor up to eight

simultaneous remote sessions.

The server offers TCP/IP support for Internet access, access in DOS and Windows applications, a communications driver that supports major multiport serial boards and a remote console that gives network managers remote access for session administration.

Full-circle

Gene Friedman, senior network manager at a large New York financial institution, said the addition of TCP/IP support is a boon for remote users.

"It's great for our overseas users be-

cause the bank's backbone is TCP/IP," Friedman said. "It's almost as if we are coming full circle here. It is as if everybody overseas and remotely and in the office, are all on a mainframe. This access server centralizes everything."

The program supports Microsoft Corp.'s Windows 3.1 and Windows for Workgroups, Novell's NetWare 3.11, NetBios and TCP/IP. The server costs \$229 for a base package with two simultaneous remote control sessions and two copies of PCAnywhere for Windows. An add-on upgrade is available for \$129. An upgrade for users of Access Server 1.0 costs \$140.

Commercial systems are equally at risk, Fugleman said. "This is not a uniquely military concern," he said.

No protection

Robert D. Steele, a former intelligence officer in the Marine Corps and the CIA and now chairman of Open Source Solutions Group in Oakville, Va., last year put together a specific list of likely civilian targets, but he now declines to reveal it for the record. "We've been pressured to stop talking about attacks on banks," he said.

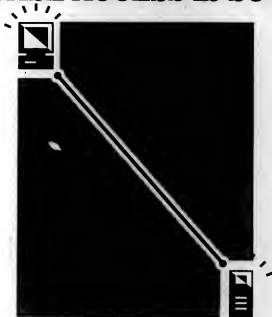
Steele said that 85% of U.S. national security communications go over commercial channels, yet the military pays little attention to protecting the commercial computing and communications infrastructure. "The [Defense Department] has abdicated its responsibility for assuring the integrity of our civil electronic defenses," he said.

But the Pentagon says it is beginning to respond to the threats.

The Army, Air Force and Navy have established information warfare centers that study the subject. The military is also developing security standards, funding the development of some commercial security products and modernizing its "military doctrine," officials said.

That military doctrine is the product of centuries of conventional warfare so bringing it into the digital age will not be easy, officials noted.

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Bank's IS staff to escape \$400M spending cuts

Chase Manhattan leans on technology assets to keep its competitive edge

By Thomas Hoffman

When The Chase Manhattan Bank N.A. announced earlier this month that it had hired Chandrika Tandon to help it pare its costs by \$400 million, the news must

have sent shivers down the spines of many of its 34,000 global employees.

Tandon, a former McKinsey & Co. consultant who now heads New York-based Tandon Capital Associates, has helped enact radical restructuring programs at

banks at Fleet Financial Group, for example, she helped the Providence, R.I., financial services giant cut expenses by \$300 million while reducing its head count by 5,500 staffers.

But while Chase's cost-cutting efforts

are expected to be felt across the board, the bank's information systems organization should go relatively unscathed. That is because Chase—viewed by many industry analysts as a technology leader among banks—plans to lean on its technology assets harder than ever to help drive new product revenue.

Do not touch

"We're currently reviewing [IS] projects on the plain to make sure they are maximizing our resources, but I think it's safe to say that technology will play a key role in helping make Chase more efficient," said Craig D. Goldman, senior vice president and chief information officer at the New York-based bank.

Few banking analysts dispute Goldman's assessment. "Chase's expenses are very high, and they've taken a discouragingly slow approach to reducing them," said Paul Mackey, a banking analyst at Dean

Witter Reynolds in New York. However, Mackey added that "it wouldn't make sense for Chase or any other bank to cut back on its technical investments" because the strategic use of technology in banking "is an absolute must for survival."

"Technology will play a key role in helping make Chase more efficient."

—Craig D. Goldman, Chase COO

Chase COO

shareholder pressure to reduce its expenses since investor Michael Price acquired a 6.1% stake in the bank in April. But Goldman said the bank's expense reduction program should have little or no effect on its ongoing technology projects.

For example, Chase is building a 5000-byte data warehouse to support its \$10 billion credit-card portfolio. The warehouse, which should be completed next month, is housed on a Sybase, Inc. relational database system running on an AT&T Global Information Solutions 3600 massively parallel processing system.

The system is expected to help Chase manage 22 million records on 15 million credit-card accounts on one database instead of on the 54 databases used now, said Bill Bradway, a technology analyst at The Tower Group in Wellesley, Mass.

Chase used to spend \$18 million annually to run its credit-card decision-support operations on an Amdahl Corp. mainframe. The shift to a massively parallel data warehouse enabled the bank to attack queries more cost-effectively than on a mainframe-based system, and it should reduce the bank's decision-support expenses to \$4 million annually, said Jane L. Landon, vice president of Chase Bank Card Services in New York.

Imagine trying to predict the impact of PC application software in 1975. It would have been nearly impossible to foresee the full power of word processing and spreadsheet programs that are now so ingrained in contemporary work culture.

Twenty years later, we are on the third-act of another revolution in computing technology. It's called "Groupware."

Until recently, computer technology has mainly served to automate transaction-based, back-office applications or to improve personal productivity. Tools to manage the rich variety of document-oriented information—which is the lifeblood of most business processes—simply didn't exist. The limitation of technology stifled teamwork rather than encouraging it. Groupware resolves these dilemmas.

So, what is groupware? Groupware is software that uniquely enables organizations to communicate, to collaborate, and to coordinate key business processes. Groupware encompasses electronic mail, but goes far beyond messaging to act as an integrated platform for the development and deployment of a new class of client/server applications—applications that structure the flow of both structured and unstructured information in business relationships—among teams, across an enterprise, and between companies.

Groupware is so compelling because it allows businesses to create an organizational memory and share knowledge and expertise across time zones, geographies, and networks. It draws together the collective intelligence found in unstructured information sources like word processing documents, electronic mail messages, and

faxes. Companies using groupware find that the barriers to high-performance teamwork that have plagued them fall away. According to International Data Corporation, groupware signals the second wave in desktop computing.

At the same time, this emerging software category has become a source of confusion. Technology buyers sometimes mistake a component of



groupware for the whole. Corporations are making enormous investments in message technology, unaware of the additional benefits of an integrated messaging and groupware infrastructure.

Groupware must combine three essential elements to be viable:

A reliable, scalable and secure distributed document database. The database-centric model gives users the ability to assemble, share, and manage the rich variety of documents vital to conducting business—business plans, contracts, orders, product information, calendars and to-do lists, multimedia

presentations, faxes, scanned images and video clips.

An integrated messaging system. Groupware users must be able to take advantage of a messaging infrastructure to send and receive electronic mail and move documents through a workflow process.

A rich application development environment. Developers must be able to rapidly build portable and scalable strategic applications which span document-oriented and structured database information.

Applications designed with these components can deliver mission-critical, enterprise-wide results like shortening product development cycles, enhancing relationships with customers, and automating a sales organization for greater productivity.

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In the coming months, we will use this forum to explore the issues around groupware. Our goal is to ensure that you make successful investments in this important product category.

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Microsoft exec retires, top tier reshuffled

By Stuart J. Johnston

After shepherding Microsoft Corp. from a \$500 million software maker in 1988 to a nearly \$6 billion juggernaut in fiscal 1995, Mike Maples last week said he was stepping down from his position as executive vice president of product

development and marketing.

Maples, who has frequently been credited with helping to craft a cohesive vision out of Microsoft's myriad technologies, will retire July 15.

His responsibilities will be redistributed among three longtime top executives at the Redmond, Wash., company. The

high-level restructuring also shifts product groups somewhat — a move that Maples said had been anticipated for some time.

Under the new structure, Paul Maritz, senior vice president of product and technology strategy, will become group vice president of a newly created plat-

forms group. That group will consolidate systems products for business and home use. It will include Windows 95, Windows NT and the BackOffice server suite as well as home platform tools such as the Bob user interface.

Also consolidated under Maritz will be the Developer Tools division, which is headed by senior vice president Roger Heinen.

Pete Higgins, senior vice president of desktop applications, and Nathan Myhrvold, senior vice president of Microsoft's Advanced Technology group, will both

become group vice presidents. They will jointly manage a new Applications and Content group, which will subsume the current Desktop Applications division, the Consumer division and Microsoft's research and on-line systems organizations.

"It was time to take Advanced Technology [the company's research arm] and integrate it into the other groups, so we would have had to do that [part of the reorganization] anyway," Maples said.



Microsoft executive vice president Mike Maples' responsibilities will be redistributed among three long-time top executives.

Joining the club

Additionally, all three new group vice presidents will become members of Microsoft's Office of the President. Previously, that office included only Maples, Steve Ballmer, executive vice president of sales and support, and Bob Herbold, executive vice president and chief operating officer.

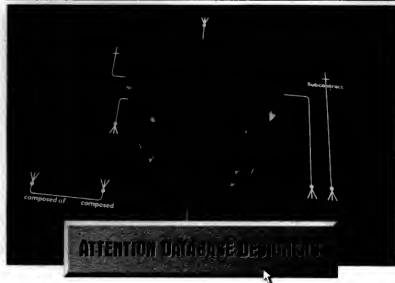
The Office of the President reports directly to Bill Gates, the company's co-founder, chairman and chief executive officer.

During Maples' tenure, the company grew from roughly 2,700 employees in 1988 to nearly 17,000 today and has boasted consistent earnings and revenue growth unrivaled by its competitors in the software industry.

Maples, who at 52 has spent 30 years in the industry, is one of the oldest Microsoft employees, and his retirement is not entirely unexpected. The average age of a Microsoft employee is slightly over 30 years.

His departure comes just prior to the delivery of two important new products — the Windows 95 operating system and an accompanying productivity applications suite, Office 95.

Maples said he is a little sad that his retirement will come before those products ship, but he and Gates have been discussing his departure for "about a year." He said his retirement date was planned to assure a smooth transition.



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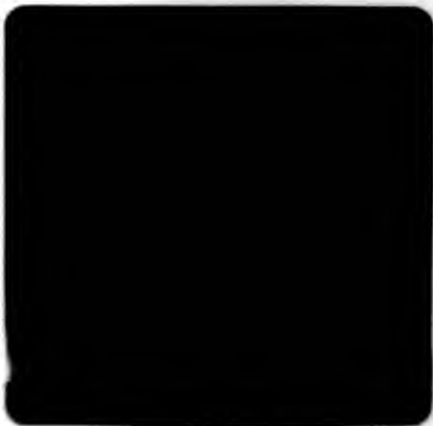
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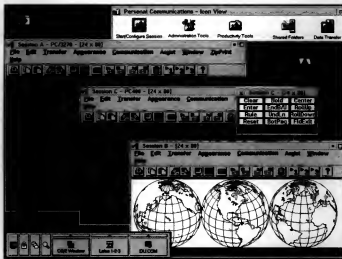
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EMC eyes mainframe disk prize

CONTINUED FROM PAGE 1

EMC's ability to stay in the technological vanguard has been a key contributor to the company's good fortune. "They're much smarter than their competitors. They just have a knack for getting things done," said Robert Galtieri, an analyst at International Data Corp. in Framingham, Mass.

The benefits of that nimbleness are apparent in EMC's numbers.

Revenue, which was less than \$200 million in 1980, should be close to \$1.9 billion this year. The value of the company's stock has risen from \$75 million to about \$4.5 billion, according to Ruetters. The Symmetrix engineering group has increased from five people to 120, while the sales force has gone from 120 to 200 employees.

Not bad for a company that was close to filing the dust before it hit pay dirt with Symmetrix. EMC almost ran out of money in 1988 and 1989 while trying to fix disk drive problems that plagued early arrays for minicomputers.

"We used to have a stack of [platters] due 15 inches high that we would sort through and decide which ones could be paid," Ruetters recalled.

"It's an amazing success story," said Mike Maggus, vice president of technology at Bell Syntex, Inc., the information systems arm of Bell Canada, Inc. in Toronto. Bell Syntex has 57 bytes of mainframe Symmetrix disks and is interested in the upcoming Unix versions, Maggus said.

Speed demon

Raw speed, fueled by large cache memories that EMC puts in its arrays, is what first won over customers. The majority of Bell Syntex's 127-byte mainframe data capacity is still on older 2380-class disks made by Hitachi Ltd. But 70% of its I/O workload runs on the Symmetrix boxes "because they're so fast," Maggus said.

Edward D. Jones & Co. reduced access times for its mainframe CICS data by more than three-fifths after replacing 3200s from both IBM and Hitachi with a Symmetrix array in early 1994, said Rich Malone, chief information officer at the St. Louis-based brokerage.

"We do better than 8 million CICS transactions a day; so those savings add up," Malone said. Edward D. Jones has since shifted all of its mainframe data to EMC boxes and has about a terabyte

of Symmetrix capacity now.

After first targeting performance-intensive applications, EMC branched out into the larger capacity-oriented part of the market last year and added full RAID capabilities in April. Despite glossy predictions, its sales have



Stan Johnson, director of MIS at WorldPro, LA in San Pedro, Calif. "We're doing Symmetrix for our overall general hardware problem with it. They're lived up to their advertising."

been completely underwhelmed by the 1994 arrival of competing disk arrays from IBM and Storage Technology Corp., said Robert Moore, a financial analyst at Morgan Stanley & Co. in New York.

While EMC's growth rate is slowing down with size, Ruetters said his plan is to increase revenue by a healthy 20% per year for the rest of the decade. But there are enough uncertainties that some analysts think EMC will have to work harder in the future.

For one thing, EMC's mainframe disk rivals have finally woken up. IBM plans to release a new fault-tolerant array next year that may make EMC's expected 1996 lead in disk shipments a short-lived phenomenon, said Paul Wallstetter, an analyst at Gartner Group, Inc. in Stamford, Conn.

Hitachi, StorageTek and Amdahl Corp. also have new disk arrays on the way. EMC has had a clear lead [on this technology], but those days are numbered," said Rob Seahar, an analyst at Meta Group, Inc. in Stamford, Conn.

Furthermore, the leap into the vendor-infused Unix market is not viewed as a guaranteed slam dunk for EMC, which expects 80% of its sales this year to be mainframe-related.

By 1998, the company hopes to get half of its business — and most of its growth — from open systems, Ruetters said. However, its first Unix entry — a non-Symmetrix array called Centrix, which shipped last fall — was meant mainly "to get something out on the market," he conceded.

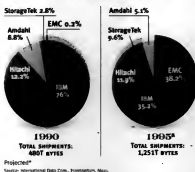
Open Symmetrix will be more robust, but getting Unix shops to pay extra for its mainframe-like features may not be easy. Conventional Unix disk arrays sell for \$4 per megabyte or less, and EMC is expected to see more than twice that for Open Symmetrix. Ruetters claimed EMC's arrays will be cheaper to operate because of their reliability and support for centralized operations.

Whether users will pony up the extra cash is unclear, though. "We always look at the total cost of ownership, and if there really was justification for a small premium [over typical Unix arrays], we might pay it," said Maggus at Bell Syntex. "But not a big premium."

The stock market has remained skeptical about EMC despite buy recommendations from 11 of the 12 financial analysts who follow the company. Before recovering somewhat in the past two weeks, EMC's share price was languish-

Big blues for IBM

These worldwide shares of terabytes shipped in mainframe disk subsystems show how the mighty have changed places



ing well below the \$24 peak it reached in the past year. Investors still worry that EMC will eventually meet its comeuppance at the hands of IBM and other rivals, Mair said.

Given EMC's success, that kind of seriousness rankles Ruetters.

"Every time it appears there's a new product coming along, the market thinks that somehow it will shake up the new order," he said. "But the evidence so far is that the only one who has been able to do that is us."

Coming on a bit too strong

To know EMC is not necessarily to love it.

After jumping into the mainframe storage market five years ago, the company cultivated a hard-charging marketing and sales style that has effectively wrenched customers out of IBM's embrace. But some mainframe shops are turned off by EMC's hyper-aggressive approach.

Kansas City Southern Railway Co. did not give EMC much consideration for a recent disk array purchase because at the time it did not have a full RAID offering, said Wayne Pattison, director of data center operations at the Missouri-based railroad. But EMC's cause was not aided by its high-pressure salespeople, he added. "I didn't respond well to their marketing tactics," Pattison said.

"They must use some sort of motivational tools on the sales force that I don't think I'd want to work under," added an IS official at a financial services company that has been weighing EMC's Symmetrix arrays against IBM's Ramec devices for an upcoming storage purchase.

EMC's willingness to go beyond normal marketing conventions manifests itself in the following ways:

• The company is not quick to admit defeat on sales. It has been known to

go so far as to make and run around reluctant IS managers to get the attention of their bosses, according to industry sources.

• In March, EMC officials publicly attacked a financial analyst for making "inaccurate and misleading statements" after he slightly reduced his financial projections because of reliability problems in a batch of disk drives EMC received from a supplier late last year.

• Later that month, EMC issued a press release claiming that IBM's 2390 storage controllers contained "a flaw" that was driving customers away from Ramec. IBM denied the assertion and accused EMC of intentionally misleading users.

Michael Ruetters, EMC's president and CEO, acknowledged that he gets a phone call "maybe every other month" from an IS official complaining that the company's salespeople "have gone beyond the call of duty in pursuit of orders."


"I want to be liked by everyone," Ruetters said. "But when you're trying to take business from IBM and customers have a long relationship of buying from them, you often have to push pretty hard. And you can't always take to for an answer."

—Craig Stedman

Scaling Mt. Symmetrix

EMC's annual revenue and profit since its Symmetrix arrays were introduced





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Computer Industry

FCC chief takes reformist tack

Reed Hundt, chairman of the Federal Communications Commission, likes to joke that he got his job because he came into the world on the same date as Alexander Graham Bell. Hundt is dead serious about most topics, though, particularly reform in the telecommunications and broadcasting sectors. Since he started at the FCC (in November 1993, he has also ruffled plenty of feathers. He recently spoke with Computerworld Senior Editor Michael Fitzgerald during a visit to Cambridge, Mass., where he gave a speech and visited with Jim Munel, chairman, president and chief executive officer of Lotus Development Corp.

Q The FCC recently completed the broadband personal communications services (PCS) auctions and raised a large amount of money for the U.S. Treasury. What do you think the impact of that will be?

A The most important part of the PCS auctions was not the amount of money it

raised for the government, but the creation of capital for efficient investment in next-generation communications networks.

Using the auction format shortens the timeline a little and guarantees that companies are where they want to be. It also permits the FCC to get enough licenses on the market quickly to encourage competition.

Q What tops your agenda for the rest of the year?

A My No. 1 goal is to engage the industry in a meaningful form of public service. I'd like to see us work on networking all the [public-school] classrooms. Ninety-seven percent of the classrooms don't have lines into them.

language at the FCC and... telecos are expert at" saying it, said Kathryn Kleiman, an attorney at Fletcher, Heald & Hildreth, a telecommunications law firm in Rosslyn, Va. Kleiman also said the FCC also has a protocol that may be confusing for those unfamiliar with the agency. Hundt also said, "The industry is going to have to spend some money" to participate in things such as the ISDN rule-making process. And there are procedures to follow.

The FCC has prepared two fact sheets—"Hints on Filing Comments with the FCC" and "How to Participate in the FCC Rule-Making Process"—both available by calling (202) 418-0300.

—Michael Fitzgerald

Second, I'd like to make sure that barriers to competition among the carriers go away. It's important to Congress that we end the distinction between local and long-distance carriers.

[I'd like to] press on vigorously with the

"I'd like to see us create fair rules of competition in all the communications markets. I'd like to see us replace paperwork with electronic filing and just generally move more toward the electronic world."

—FCC Chairman Reed Hundt



[PCS] auctions. We start the C Block auction Aug. 2.

[The C Block is a piece of spectrum that has been reserved for entrepreneurs (companies with less than \$15 million in revenue or \$500 million in assets). Businesses with less than \$40 million in revenue or minority- or women-owned businesses receive special bidding credits.]

Q This last round of auctions has set down a lot of attention. How much of an impact will they have?

A You have to have at least five sellers in a market to create real competition. This is why this fifth auction is crucial.

Q You seem to suggest the FCC may need to change radically. Is it your goal to be the makeover of the FCC as your legacy?

A There are a range of issues that I'd like to see addressed. I'd like to see us create fair rules of competition in all the communications markets. I'd like to see us replace paperwork with electronic filing and just generally move more toward the electronic world.

IBM to trim paychecks of rank and file

By Craig Stedman

After returning to the black in 1994 and reporting record first-quarter results this year, IBM is not forgetting about the little people — although some rank-and-file employees facing pay cuts probably wish it would.

IBM's renewed financial vigor, which is due in large part to massive layoffs in recent years, earned its Top 5 executives combined bonuses of \$5.5 million for 1994. But now the computer giant is telling some secretaries who survived the layoffs that they are overpaid.

As part of a continuing effort to get its costs in line with those of other companies, IBM is reviewing salaries across the board. While an IBM spokesman said some engineers may actually get raises as a result, a group of 135 high-level executives will see their pay reduced by as much as 30%.

The highest base salary among the secretaries included in an internal IBM survey was \$70,000. In some cases, overtime pay and bonuses pushed the total salary up to approximately \$130,000, according to IBM officials.

Other IBM employees might also see line for salary reductions, the spokesman said, although he did not specify how widespread the cuts could be. The company's actions got a decidedly mixed review from industry analysts, who said the pay cuts could cause both morale and image problems.

The salary review was "by and large a prudent thing to do," said Bob Dardjevic, president of Ames Research in Phoenix. But balanced against the big executive bonuses, the cuts pose "a risk that this could be seen as a case where what a good for the goose isn't good for the gander," he added. "That could cause some raised eyebrows, if not outright ire."

A group of 120 high-level IBM secretaries will see their pay reduced by as much as 30%.

Talking to the FCC

The FCC will make its coming Integrated Services Digital Network (ISDN) Notice of Proposed Rule Making available at its Internet site <http://fcc.gov>, or www.fcc.gov.

The FCC encourages formal and informal responses, but some warn that players unfamiliar with how the commission does business will have to work harder to make themselves heard.

In particular, the commission would like to hear from the computer industry, said FCC Chairman Reed Hundt. However, "there's a

based in Durham, N.C., says it has realigned management, cut staff from 502 to 406 and will focus on its new Object-Pool product for integrating client/server systems with mainframe applications.

HP profits up 41%, stock drops
Hewlett-Packard Co. posted a second-quarter profit of \$577 million, up 41% from \$409 million last year. Revenue grew 19%, from \$6.25 billion to \$7.45 billion. HP stock dropped 41.50 a share at the news. Chief Executive Officer Lewis Platt said a director of National Semi-

conductor Corp. to focus on his role as founder and chairman of Wave Systems Corp. No successor has been named. ...

Dell profits soar

Dell Computer Corp. said strong Pentium sales and a rebounding notebook computer business led to profits of \$61.7 million on revenue of \$1.14 billion for the quarter ended April 30. In the same period last year, Dell profits were \$19 million on revenue of \$706.6 million.

SHORT TAKES After 29 years, Peter J. Sprague last week resigned as chairman and a director of National Semi-

conductor Corp. to focus on his role as founder and chairman of Wave Systems Corp. No successor has been named. ...

Briefs

Sapiens loses rises

Sapiens International Corp. blamed an operations loss of more than \$20 million on the unsuccessful expansion of its application development tools business into the low-end client/server market. The loss for its fiscal year ended Dec. 31, 1994, comes against total revenue of \$37 million. In 1993, Sapiens lost \$1.8 million against total revenue of \$45 million. Sapiens, with U.S. operations

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July 17	June 30	July 7	CW Guide To: DBMS The focus of database management systems is as the server for a variety of applications. Depending on the application type, IS organizations face varied buying decisions. We will examine which databases match which application needs best and analyze the leading products in each area. Buyers' Satisfaction Scorecard: Market leading SQL database mgmt. systems for midrange servers Firing Line: Latest DBMS from a leading vendor	
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July 31	July 14	July 21	CW Guide To: Workgroup and Collaborative Software Beyond e-mail and document management users are seeking products that help them manage business processes and work as teams. This Guide will examine how well the vendors are meeting this need. Buyers' Satisfaction Scorecard: Market leading workgroup software Firing Line: Latest collaborative product from a leading vendor	
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Aug. 7	July 21	July 28	Special Report: Re-engineering the Workplace	
Aug. 14	July 28	Aug. 4	CW Guide To: Desktop Databases Personal databases that act as front ends to company applications and DBMS, as well as PC-based packages that serve the needs of workgroups or departments will be examined with the focus on IS buying decisions. Buyers' Satisfaction Scorecard: Market leading desktop databases Firing Line: Latest DBMS from a leading vendor	Object World San Francisco 8/15 - 8/17
Aug. 21	Aug. 4	Aug. 11	Closer Look: Sun Workstations	
Aug. 28	Aug. 11	Aug. 18	CW Guide To: Client/Server Financial Applications One of the first applications companies move off of the mainframe is financials. But only recently have the vendors begun producing true client/server offerings. We'll look at how users like them and what more they need. Buyers' Satisfaction Scorecard: Market leading client/server financial software Firing Line: Latest client/server financial software from a leading vendor	Starch Study
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Retrain, don't trash

The time has come to stop wringing our hands about the "skills gap" and start the real task at hand: retraining legions of Cobol programmers in the technologies that will dominate the next decade.

Unfortunately, I think a lot of CIOs just don't think their people have the stuff to make the switch. That's unfortunate, because treating people like old furniture trivializes the important business skills they can bring to the table and discounts the responsibility that businesses have to their employees.

All too often lately I've encountered attitudes like the one I saw at a lunch break during a recent industry conference. A well-known CIO shook his head sadly and lamented that half his programmers wouldn't be able to make the transition to object-oriented technology. Another notable CIO at the same table said the figure is more like 75% at his company. Other IS execs in attendance nodded in mournful agreement.

To hear some execs talk, you'd think that the best thing to do with mainframe programmers is put them on an ice floe somewhere and rest them loose. What a waste of potential. You don't have to be an anthropologist to know that human beings are remarkably adaptable animals. So give them a chance to adapt. Especially because users who have really committed to bringing programmers across the gap are seeing success.

Penzoni achieved a goal I set two years ago of moving 50% of his programming staff to client/server technology. Brett Mays, director of information technology at Penzoni, says the business skills and judgment of the experienced programmers complements the enthusiasm of the young code jockeys. "We have a mix of Young Turks moving ahead recklessly and older people helping them not to leave things out," he says. IBM committed to moving 100% of its mainframe programmers in one California lab to client/server technologies and nearly hit the mark, according to Tom Purdy, a general manager at IBM. "Make it clear to the organization that their skills will be valuable in the future," he says. Legent Chief Technology Officer Bob Yellin notes that not everyone completes the transition, "but ones who do are terrific."

Put the same question in a different business context. Suppose you had to sell your CEO on a technology that promised to double the productivity of your salespeople, but only if you fired two-thirds of them first. How far do you think that idea would get? Cutting mainframe programmers to the wires is fundamentally no different.

I thought Hughes Aircraft CEO Jim Woods summed it up nicely in an interview last fall: "We made these people," he said of Cobol programmers. "They're our responsibility."

Don't give up on people until you give them a chance to change. You'd want no less for yourself.

Paul Gillin, Editor
Internet: pgillin@mc.com



Follow the leader?

"Big win for Win 95" [CW, May 1] left me with an image of the Pied Piper of Hamelin leading a sea of lemmings in a rush toward perdition. The emotional aspect of this picture was enhanced by Paul Gillin's speaking of "long-suffering legions of OS/2 users."

Anyone who relies on a computer is "long-suffering" because we don't yet know enough to make these machines truly easy to use. But if we know there is a solution that is truly better and turn our backs on it — as Gillin strongly suggests we do with OS/2 — then we really are behaving like a bunch of mindless ninjas following whomever charms us with the prettiest tune.

John Kosciak
Chiefmart

Quality answers

"Quality questioned" [CW, April 24] is misleading about the deployment of Microsoft Office at Du Pont. Given our own information and recent discussions with Du Pont, I'd like to clarify several points:

Du Pont is not "yanking the latest release off thousands of Macintoshes." Microsoft Office continues to be the desktop standard at Du Pont, where approximately 50% of the desktop computers are Windows- or DOS-based. Office for the Macintosh has been deployed on a relatively small number of desktops. Some users of the older, slower Macs have chosen to stay with an earlier version.

Du Pont did have some concerns about the initial release of Office

for the Macintosh, which we addressed with a maintenance release, Office 4.2.1, that was shipping even before your story was published.

Neither the Office nor Word maintenance releases arrived "three months late." Microsoft announced in January that it would ship a Word maintenance release in March and an Office maintenance release in April. Both arrived on time, as promised.

Robbie Bach
Director, product marketing
Microsoft Desktop
Applications Division
Bellevue, Wash.

They've had it, too

I have to agree with the Digital customers who have "a litany of complaints about deteriorating support and service" ["Has it now?" CW, April 24].

As the beta site for Digital's integration of DewarView editorial software for newspapers, The Advocate has struggled through 2½ years of bugs, missed deadlines and nagging upgrades. Now that we're nominating the majority of our pages, the annoying bugs have turned into a major infestation.

Where is Digital when we ask for help? Hot on the heels of a potential buyer. Apparently, Digital still hasn't figured out that the best advertisement is a happy customer.

Phil LaRoche
News systems manager
The Advocate
Baton Rouge, La.

You took the words right out of my mouth — "Has it now?" tells it like it is.

We have been a longtime Digital

user and still have loyalties to Digital. However, because of Digital's reorganization, we get very little sales support from them and now have to deal with Digital-authorized distributors. We are a \$100 million company that is growing very fast and think we deserve more direct attention from Digital.

Sadri Bebbani
Hillsboro, Ore.

This is a test

How on earth does IBM believe it's going to compete with Microsoft's Windows 3.1, much less Windows 95? No user can use software that cannot be installed, so it matters little what improvements are incorporated into the product.

OS/2 Warp installation is a nightmare. Without prior warning, IBM chose not to deliver the 5¼-in. diskettes required to boot from the A drive. Why hasn't IBM figured out how to launch an upgrade from the currently installed version?

IBM, if you had wanted me to beta-test Warp, you should have made arrangements with me; that's what any honest vendor does.

Robert E. Dooney
New York

■ Computeworld welcomes comments from its readers. Letters should not exceed 300 words and should be addressed to Bill Lebern, Editor in Chief, Computeworld, P.O. Box 997, 375 Cochran Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

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Desktop Computing

AST, DELL CEOs PEER
INTO YOUR PC FUTURE, 49

Desktop outsourcing wave

Users turn to Digital, Unisys, IBM, others for one-stop support services

By Julia King

Responding to fast-growing user demand for one-stop PC and network support, several of the industry's largest hardware vendors are repositioning themselves as service outsourcing. That move leaves them vying with more traditional support providers for a larger share of the booming desktop services market.

Last week, Digital Equipment Corp. became the latest entrant in the \$6 billion desktop services market, announcing PC Utility and Software Utility, an array of products and services covering the purchase, management and ongoing maintenance of desktop hardware and software [CW, May 15]. Users pay a monthly fee for services they choose to buy. Fees

range between \$100 and \$400, according to a Digital spokesman.

Other big-name players include IBM, which in March launched a similar offering known as NetworkStation Management Services, and Unisys Corp., which took the wraps off its multivendor desktop services offering two weeks ago.

All-around coverage

The feature that distinguishes all three vendors' offerings from more traditional PC maintenance contracts is the scope of their coverage, which can include the following:

- Hardware and software procurement.
- Ongoing support and maintenance.
- Helpdesk services.
- Hardware disposal.
- Desktop and network technology upgrades.

Users look for outside help

The following are recent desktop outsourcing deals. In most desktop deals, a single provider is named to replace dozens of vendors.

Customer	Vendor	Contract specifics
Chemical Banking Corp.	Unisys	Three-year contract to maintain 30,000 desktop devices worldwide
McDonnell Douglas Corp.	IBM	Contract to maintain 50,000 networked desktops
University of Pittsburgh Medical Center	Digital	Three-year contract to service 6,000 PCs, 3,000 printers and other desktop devices

*Strategic consulting

Historically, users have hired as many as a dozen different service contractors to perform such an array of services, often paying them on a time and materials basis.

"Now, the issue is much bigger than fixing a PC when it breaks. It's more like knowing how many PCs you have, knowing which PCs have which versions of software and who has access to what," said Allie Young, a senior analyst at Dataquest Worldwide Services Group in Westboro, Mass.

"The trend is not just managing PCs but managing distributed systems," she said.

In many cases, the growth of client/server systems and the rapid deployment of distributed desktop devices have made computing environments too complex and too fast for users to maintain on their own, according to users and analysts. In turn, increasing complexity has meant increased PC life cycle costs, which Gartner Group, Inc., a consultancy in Stamford, Conn., pegs at around \$40,000 over a five-year period.

"As a result, outsourcing PC purchases, maintenance, training and the overall care and feeding of networked systems is a very rapidly growing market," said Ladd Willis, executive vice

president at First Manhattan Consulting Group in New York.

Even though reduced costs are touted as one of the key factors driving the desktop services market, it still remains unclear precisely how much—if at all—companies are saving by off-loading support responsibilities to outsiders. What many users deem more important—at least for the time being—is the quality, consistency of service and strategic help the outsourcing firms can furnish.

Helping with specifics

At Chemical Banking Corp., for example, part of Unisys' mission under a three-year, multimillion-dollar desktop services contract is to identify on a case-by-case basis which devices would provide the greatest upgrade pay-

back, noted John Irvine, a vice president at the bank's technology and operations unit.

Meanwhile, IBM has helped McDonnell Douglas Corp. to significantly improve the consistency of service to 50,000 LAN users by consolidating more than 35 help desks into two, according to Joe Deney, vice president and general manager of information systems.

The bottom line, according to Young, is that even in the absence of firm cost savings figures, "a lot of companies are realizing somebody else can do it better, cheaper and/or faster."

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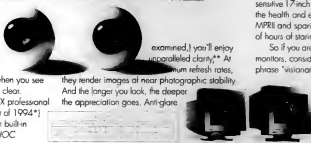
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■ IBM's Internet Connection for Windows is a complete redesign of OS/2 Warp's Internet browser - not a port. That's too bad because it suffers from several first release bugs that mar its otherwise excellent interface.

■ The problems that plagued us included RAM-hungry communication drivers.



passwords stored in ASCII, frustrating circumstances that prevented modifying or deleting erroneous account information and modern scripts that crashed the system after sign-on. IBM says the next release will address the RAM and modern configuration issues. A future version, planned for use on a LAN, will offer password encryption.

IBM's Internet for Windows drives well

By Howard Millman

IBM, satisfied with the reception and access of the Internet access utility it built in OS/2 Warp, has released a companion access product for Windows: Internet Connection for Windows Version 3.0. According to IBM, it is a complete redesign, not a port, of the OS/2 product. That's too bad because it suffers from several first release bugs that mar its otherwise excellent interface. Although the release is a 3.0 version, it's the first release for Windows, the other two were DOS versions.

The problems that plagued us during a test drive included RAM-hungry communication drivers, passwords stored in ASCII, frustrating circumstances that prevented us from modifying or deleting erroneous account information and modern scripts that crashed the system to crash after sign-on.

IBM, which acknowledged the problems, promised that the next release will address the RAM and modern configuration issues. A version planned for use on a LAN will offer password encryption.

We think finding a way to load the software's drivers into high memory - or preferably delay execution until the program executes under Windows - should get the highest priority. The TCP/IP and other drivers claim nearly 70K bytes of hard drive real estate - more than enough to crash some DOS programs. In this version, the batch file must execute before Windows starts. Ultimately we need Quarterdeck Office Systems' QEMM to reclaim most of the conventional memory usurped by the hangry batch file.

After loading the software we encountered another problem, this one caused by a typing error made while entering our account information. Strangely, the

program refused to let us correct the error, delete the account or open a new account with the same name but a different password. You need to live through this to appreciate the frustration.

When we finally resolved our Internet access, vehicle's "tune-up" problems, we raced up the access ramp and cruised the information highway in grand style.

The software proved a joy to use. It doesn't offer a printed manual, nor does it need one. The built-in, context-sensitive help files provide adequate information. As an introduction to the "net" for newcomers, the package offers preconfigured destinations including business, entertainment and research areas and Internet assistance utilities. Its WebExplorer is a specially customized and highly intuitive version of Spyglass, Inc.'s Enhanced Mosaic interface.

Plenty of options

The product delivers full access to the Internet including the World Wide Web, file transfer protocol, Gopher, Telnet and electronic mail.

As you cruise along, you have the option of saving addresses of intriguing places with a mouse click. The product temporarily buffers text for backward scrolling and will permanently store downloaded data. We would like to see a one click method to open a default capture buffer. Files can be saved in HyperText Markup Language format, which preserves their hypertext structure, and stored in ASCII text.

Performance at 6.6 bit/sec. was tolerable. Available now, the program costs \$10 - a fair price for a trip into cyberspace.

Millman is a principal at Data Systems Services in Croton, N.Y., a consultancy that specializes in information systems services.

AST, Dell CEOs peer into the future

Notebook, consumer markets show promise

By Jaikumar Vijayan

Safi Qureshi, chief executive officer of AST Research, Inc. in Irvine, Calif., is trying to turn the \$2.36 billion company around after a disappointing 1994, when AST lost money and market share. He talked with Computerworld about what the company has learned and what it is doing to turn things around.

On one of the lessons AST has learned from the past year:

"The fact model change is a reality in this business... if we don't execute on time, there is no forgiveness in this market."

"In calendar 1994, we positioned Pentium at the higher end of the market [while the volume was at the lower end]. We have learned the lesson... In the coming months, you will see us coming out with more leading edge products at the front end of the product cycle, priced at the heart of the market and delivered through the channel."

On the turnaround AST is trying to achieve and its progress so far:

"The major issue we saw was that we had to become a more dependable, more credible supplier to our major corporate customers. 'I am satisfied [with the progress so far]. We cannot declare victory come June. We still need to keep asking some basic questions.'"

On shifts in the market:

"There is a fundamental shift in the market... Today we see many parts of our business being driven by the consumer and small business market. They are becoming early adopters of new technology. They are much less scared of technology."

On how AST hopes to leverage its recently announced partnership with Samsung Electronics Co.:

"There are two synergies - the strong cash infusion [that Samsung brings] and the strong position that Samsung has in certain key component markets. We understand PC technology and usage, [while] Samsung is focusing a lot on multimedia, digital video and things like that for the home environment."

AST and Samsung will look for opportunities to leverage these mutual strengths in evolving home and consumer markets, Qureshi said.

Michael Dell, founder and CEO of \$3.5 billion Dell Computer Corp. in Austin, Texas, recently talked with Computerworld about a number of issues, including his company's management of some large corporations and how this is affecting vendors.

On trends in managing distributed assets: "All over, companies are putting in place systematic programs [to handle distributed computing environments]... Customers are asking much more for the fully outsourced [service] solution... so they are able to focus on their core businesses instead."

On what this has meant for vendors like Dell: "Most customers are looking for a 'more integration, more global pricing and stan-



▲ **AST's Safi Qureshi:** "If we do not execute on time, there is no forgiveness in this market."

Dell's Michael Dell: "Customers are willing to pay a tremendous premium for consistency of platform." ▼



dardized) global configurations... A lot of these things are uniquely suited for the direct model."

"The biggest challenge is putting in place the manufacturing and the growth infrastructure... There is an increased need for project management. Manufacturing has become a major project management task."

On the need for hardware standards:

"Nonstandard PC hardware platforms 'are incredibly disruptive... What we are discovering is that customers are willing to put a tremendous premium on consistency of platforms.'"

On where the market opportunities are:

"The notebook and the server markets offer a tremendous opportunity to differentiate. Things like ergonomics or battery performance or system reliability... these are areas where [vendors] can differentiate."

On cost of ownership:

"A lot of companies are struggling with this whole \$400 issue," Dell said, referring to Gartner Group, Inc.'s estimates on the cost of owning a PC over its lifetime. "It literally is the topic of conversation."

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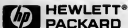
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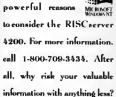
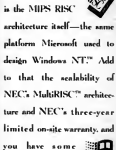


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Super diskette goes head-to-head with CD-ROMs

By Steve Moore

Desktop power users will enjoy nearly an 80-fold boost in removable disk storage capacity later this year with the promised introduction of a 120M-byte diskette. However, industry observers are already questioning how much need there will be for diskettes in the future.

The diskette is being jointly developed by Compaq Computer Corp. in Houston, 3M Co. in Minneapolis and MKC Ltd. in Takamatsu, Japan.

But although the new disk will be backward-compatible with the large installed base of 1.44M-byte floppy drives, "software distribution has already moved to CD-ROMs, and I don't think there is any

way to get it back to floppies," said Michael Peterson, president of Strategic Research Corp. in Santa Barbara, Calif. Within two years, he said, "everything floppies are used for today will

Storage sampler

Storage device	Capacity for compressed full-motion video
650M-byte CD-ROM	27 minutes
120M-byte floppy	5 minutes
1.5M-byte floppy	less than 4 seconds

be taken care of by alternative media."

The floppy would be appropriate primarily for backups, said Larry Shaw, PC coordinator for client/server support at Nordstrom, Inc. in Seattle. "If it's a cheap enough alternative, it would be useful instead of tape," he said.

But because virtually all of the big retailer's PCs are already attached to LANs, backups now are transmitted across the LAN, not stored on disks, Shaw said. The floppies "could be useful on stand-alone desktops but not on networked desktops," he said.

Use of floppies for backup will decline because large companies such as Nordstrom will soon have as much as 90% of their desktop machines attached to networks, Peterson said. "The major telecommunications and information service providers will offer on-line backup services in the next two years," he added.

Price a factor

Even with its backward compatibility, "this product will be impossible to move into the mainstream unless they can hit price levels of less than \$100," said Patty Chang, a principal analyst at Dataquest, Inc. in San Jose, Calif.

Several vendors are now working on erasable CD-ROMs "that will have 650M-byte capacity and will play back all existing CD-ROM disks," she said. Fifty-eight million CD-ROMs were sold in the entertainment and educational markets last year, Chang added.

With CD-ROMs pre-empting software distribution and backup applications, the 120M-byte floppy technology "will be nothing more than another external disk drive," Peterson said.

The floppies will then have to compete with Iomega Corp.'s 100M-byte Zip drive and similar products that are "side-stream, not mainstream," he said.

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Brief

Apple offers new printer

Apple Computer, Inc. has announced a new version of its popular StyleWriter low-cost ink-jet printer. The StyleWriter 1200, priced at \$299, increases resolution to 720 by 360 dots/in., compared with 360 by 360 dots/in. in the previous version. The 1200 model also increases printing speed to 3 pages/min. vs. 2 page/min. with the StyleWriter II.

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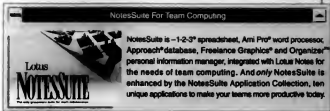
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White
Paper

May 22, 1995



IS Priorities

As The Information Highway Era Begins



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Entering a New Era of Growth

The Information Technology industry is entering a major new phase of growth and expansion. Some call it the information superhighway, the I-way or the Infobahn; others label it our emerging national and global information infrastructures. But no matter what name is used, it represents a paradigm shift that will have profound implications for business and society.

The forces behind this shift have been building for more than a decade. Computer hardware, particularly the personal computer, has grown in power and numbers. Some 100 million PCs worldwide are now used by business, and more than 50 million are used by consumers. Communications software has made the connection of previously isolated PCs routine. Microprocessor technology has evolved to encompass not just PCs, but families of increasingly powerful scalable systems and servers that can store and manipulate unprecedented quantities of real-time information.

In telecommunications, a global trend toward deregulation is leading to a new era of innovation and competition in what was once a slow-moving nationalized sector. The pace of change in this area, particularly data communications, is being driven by dramatic progress in microelectronics and transmission media. In the coming decade, advances in telecommunications should match, or even exceed, those of microprocessors.

The marriage of powerful low-cost computers and this vigorous telecommunications environment is leading to what may be the most fertile and exciting period in the history of the IT industry. Even after discounting the exag-

gerations of suppliers and dramatizations on the part of the press, these changes represent nothing less than the next stage in the evolution of our industry — one of pervasive, societal connectivity.

Today, more than 30 million users are linked to increasingly interconnected computer networks of all types. By the year 2000, that number will swell to well over 100 million, providing a critical mass of telephone-like interconnectivity.

But more important than mere numbers, this new era will change the way computers are used. Always used to improve internal business activity, computers will soon be increasingly employed to automate external links between customers and suppliers in a manner similar to the telephone, but far more powerful. These external applications have the potential to transform businesses and improve productivity to an extent never before possible.

Although adoption rates for new technologies usually lag behind availability, interest in harnessing the potential of computer networks is soaring. In many economic sectors, maturing industries are seeing declining margins, increased global competition and reduced customer loyalty. Meanwhile, consumers, oversaturated with commercial messages, are becoming immune to traditional forms of mass media. Business leaders anticipate the information highway becoming a new distribution channel, one that offers direct — and potentially more profitable — relationships with customers.

In response to these new demands and opportunities, International Data Corp., the IT industry's leading market research and consult-

ing firm, interviewed some 1,000 IS managers in the United States to learn how their priorities are changing. This White Paper presents the highlights of IDC's research, which identifies customer attitudes, issues and plans during

the early years of this paradigm shift. These pages will show that leading-edge users in many industries are already adopting the applications, technologies and strategies that will reshape the industry landscape by the year 2000.

About the Survey

In December 1994 and January 1995, International Data Corp. conducted phone interviews with 1,000 IS executives at organizations with 250 or more employees. Only individuals qualified to answer questions on the organization's use of and plans for its entire computer network could participate. Typical titles of respondents included director of IS, network manager and IS planning manager.

IDC used a stratified, random sample approach to guarantee that roughly 100 interviews would be completed in each of these nine industries: banking, insurance/other finance, process manufacturing, discrete manufacturing, retail, transportation/communications/utilities, government, health care and business services. Another 30 interviews were conducted with educational institutions and 30 more were spread across all other sectors. IDC further segmented the data by enterprise revenues or budgets,

using the following ranges:

- Less than \$50 million
- \$50 million to \$200 million
- \$200 million to \$1 billion
- \$1 billion to \$5 billion
- Over \$5 billion

Survey names were drawn from the Computerworld Database Division, which maintains a vast file of U.S. computer installations and IS professionals. Individuals at 1,552 organizations were contacted; 541 declined, resulting in 1,011 completed interviews. Given this 65.1% response rate, overall survey accuracy is plus or minus 3% at a 95% confidence interval.

Each interview lasted nearly 25 minutes and included over 40 questions, only a few of which are presented in the summary that follows. For information on the full study, entitled "Changing IS Priorities as the Information Highway Era Begins," please contact IDC's Lisa Bloom at (508) 955-4236.

This White Paper was prepared by David C. Moschella, senior vice president of worldwide research at International Data Corp. Mr. Moschella manages IDC's global research strategy and is a specialist in understanding major periods of technology change and their impact on both suppliers and customers. IDC, based in Framingham, Mass., is the IT industry's leading provider of market research and consulting services.

IS Priorities

As The Information Highway Era Begins

An Evolutionary Perspective

It is important to view the changes which are reshaping the industry landscape in the contexts of both the past and future. Figure 1 depicts the long-term view of the IT industry's four waves of change.

During each previous period, it should be noted that IT spending accelerated while customer usage shifted. Another constant: in each period, the identities of the leading suppliers changed.

The first stage, which dominated the period from 1944 to 1981, was centered around "big iron" — proprietary mainframes and minicomputers — and was focused on large institutions. Nevertheless, this stage involved a relatively limited number of information workers — some 10 million worldwide. Its market presence peaked in the early 1980s and since then it has gradually fallen into decline. One liability was terminal connections. The communications paradigm of the first stage, they have dwindled to inconsequence.

Focus on the Individual

The second wave of industry expansion coincided with the arrival of the IBM PC in August, 1981, and the ensuing PC-compatible industry. This wave centered on individuals — in the workplace (especially the white-collar and professional arena), in schools, and increasingly, in the home. Although the technological center of this wave has been the PC, whether standalone or in a LAN, it has more broadly encom-



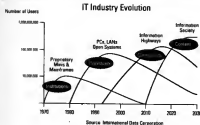
be the defining priority of the next decade will be the establishment of pervasive IT connectivity.

passed the entire open systems revolution, bringing new levels of standardization to what had been a closed, proprietary industry.

For the past 10 years, the business community has been working toward integrating the individual-based PC into an overall enterprise environment. The early 1990s have been dominated by client/server computing, whose major focus has been on various internal automation activities. The three most common areas for client/server have been downsizing, business process re-engineering and enterprise messaging systems.

What will make the coming era the third great wave of industry expansion? The answer: a paradigm shift away from primarily internal automation toward increasingly external communications. The defining priority of the next decade will be the establishment of pervasive IT connectivity, i.e., telephone-like ubiquity but with all the power of a gen-

FIGURE 1



eral-purpose computer.

In this coming era, instantaneous computer communication will become commonplace between businesses, consumers, educational organizations and state, local and federal governments. Each segment will be transformed by the ability to easily overcome the barriers of time, distance and volume. This period will be marked by the easy and efficient connection of buyers and sellers.

It is this spirit of mass connectivity, of an increasingly wired world, that will define this new era. The supporting information infrastructure will encompass an array of transmission bandwidth, media and network devices, as well as a nearly limitless spectrum of emerging applications.

True Information Society

IT evolution will not end with the current connectivity phase. Once the global information infrastructure has matured, there will be steady progress toward a true information society.

This fourth great phase will be characterized by the arrival of fully converged, all-digital, multimedia content. During this period, notions of being connected, or wired, will be as commonplace and as transparent as the telephone connections of today. The creation of this inter-connected computer landscape will be the lasting legacy of the third wave.

Figure 2 provides a conceptual view of these changes from a customer perspective. Historically, the primary use of information systems was to improve business productivity by automating the internal activities of a company, such as payroll, accounting, inventory, transaction processing, and document creation and management. Even today, these basic applications continue to account for the bulk of current spending by businesses.

But there has always been a limited amount of inter-enterprise computing. In the business sector, specialized systems such as those for reservations, stock trading, credit card verification and automatic teller machines have existed for years on secure private networks. For that matter, so have a variety of Electronic Data Interchange (EDI) applications, which have traditionally been driven by a specific industry focus.

Nevertheless, during the 1990s, the focus of most

IS departments has been entirely intra-enterprise.

However, the arrival of widely available Internet access, and other public networks, is making inter-enterprise networking available on a mass-market basis for the first time. Indeed, the traditional use of the Internet by research organizations and universities was the prototype of all that is happening in



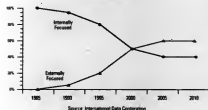
the arrival of widely available Internet access is making inter-enterprise networking available on a mass-market basis.

business today, where many companies are, setting up home pages on the World Wide Web to give their customers a wide range of information, including product specifications, software descriptions, press releases, documentation and research reports.

In many ways, the Internet as it exists today can be viewed as the prototype of the communications environment of the future. Simply by virtue of its definition of a few relatively simple standards, the Internet has greatly facilitated inexpensive inter-enterprise communications. Nevertheless, perhaps because of the Internet's almost accidental explosion, the future of this phenomenon is the subject of much speculation.

FIGURE 2

Changing Customer Priorities
1985-2010



Current Network Environment

This White Paper will examine the network plans of corporations for the next few years. But what do computer networks look like today? How are they used? How important are they to current business operations? This section will examine the current situation, so readers can gain the context they need to understand current strategies and directions.

Networks are the lifeblood of most of the 1,000 organizations surveyed by IDC. The majority — 56% — view networks as critical, while 29% call them very important and 11% dub them important. Fewer than 4% of the respondents report that networks were of minor or no importance.

Figure 3 goes deeper, looking at the percentage of respondents in each major industry sector that view their networks as critical to their operations. The industry differences are dramatic. According to responses here, banking, insurance and the services sectors are the most dependent on networks, with government and health care the least dependent.

Networks Are Not Builders

It is hardly surprising that manufacturing industries depend less on networks than the financial and services sectors. After all, manufacturing firms ultimately produce a physical product, an activity that

Network Utilization: A Global Comparison

This survey focused entirely on the U.S. situation. But networks have become a global phenomenon. Given the importance of computer networks, many countries are now very conscious of the need to have a competitive network infrastructure. What does the picture look like in other world economies?

With offices in more than 40 countries, IDC has been able to conduct extensive research on this issue for many years. The U.S., Europe and Japan today account for more than 80% of today's IT usage, a dominance particularly true in advanced network environments. In general, the U.S. is the most developed customer market. Northern Europe often approaches U.S. levels of usage, while southern Europe and Japan often lag considerably. U.S. leadership is particularly noticeable in terms of all things related to the

Internet, which has its roots in the U.S. defense and university systems.

Global network sophistication can be compared by using metrics such as percent of employees using company networks; types and volumes of network traffic; current levels of technology usage; and network application portfolios. The U.S. leads in virtually every category, although Scandinavia, in particular Denmark and Sweden, approach U.S. levels in many areas. Southern Europe, including France, Italy, Spain and Greece, usually lag well behind, with Germany, the U.K. and the Netherlands somewhere in the middle. For cultural, technical and competitive reasons, networking technology is not as pervasive in Japan as in other developed countries.

Over the past few years, the global competitive position of U.S. businesses has increased substantially

in many sectors, stemming and even reversing the worrisome trends of the 1980s. It is accepted that U.S. businesses have quickly responded to global competition by adopting flatter, leaner organizations. Although it is too soon to fully assess the role that technology has played in facilitating these restructurings, there is growing support for the view that U.S. companies' aggressive use of technology and their increasing competitiveness are closely linked.

This message has certainly reached the capitals of Europe and Asia. As European economies recover and as Japanese industry moves to compensate for the high value of the yen, emphasis on using technology to improve efficiencies is increasing. Both business and government are concerned that the current technological gap with the U.S. might widen further. External inter-enterprise networking is now taking off in the U.S. Expect European and Japanese businesses to follow.



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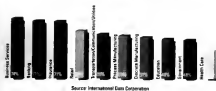


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FIGURE 3

Role of Computer Networks by Industry
Percent of respondents viewing networks as "critical"



Source: International Data Corporation

networks can facilitate but one they cannot fundamentally transform. Computer networks alone cannot construct a house or build a refrigerator.

In contrast, the banking and insurance industries do not produce a physical product per se. They are, in many ways, pure information processing activities. In theory, virtually everything done by the companies in these industries could be done over networks and managed by software, with little need for

buildings or other physical resources.

Accordingly, it is not surprising that the retail and utility sectors fall between the financial and manufacturing sectors in terms of network use. The data indicates that the overall importance of networks rises with the "information intensity" inherent in the industry. IDC expects that such "network dependency gaps" between physical and information industries will not only continue but probably accelerate.

Contrasting these patterns are the relatively low figures of network dependence for the government and health care industries. Because these sectors are a mix of physical and pure information processing activities, theoretically their use of networks should be at least as critical as the manufacturing industry's.

Could their lack of reliance on networks be linked to widely perceived concerns about overall productivity in these sectors? Few would question that more advanced use of IT is critical to any efforts to "re-invent" government or cut through the mountains of paperwork that threatens to overwhelm the health care sector.

No matter what the industry, the organizations

Customers Sound Off on Network Strategies

As part of the research process, IDC asked a number of open-ended questions that allowed participants to speak their minds. Below are a selection of comments IDC received when it asked respondents for any additional comments regarding their network strategies and challenges.

- We don't know where we are headed.
- We are currently expanding the use of EDI at our facility with our suppliers and vendors.
- The Internet will provide critical competitive advantage to knowledge-based companies (especially to health-care).
- Our site will be using EDI to process insurance claims. I am concerned with

the protocol that may be used for this task.

• The network has to grow in order for the business to grow. It is one of the foundations of our business. We process information, and information is money.

• Our priority is external E-mail to our customers. Our real focus is on the customer and not on the suppliers. We are the supplier.

• If we left the network was secure, we would do transaction processing over the Internet.

• We are trying to figure out how to integrate the Internet into our business.

• It's like chasing a racahorra: the technology goes too quickly. Getting the skill set to follow up is incredibly hard.

• In general, the Internet access issue involves the issue of data security on the net and until it is resolved to our satisfaction, we are not putting mission-critical applications on the Internet.

• I can see businesses being run entirely electronically.

• My biggest concern is with security and not letting people access my organization that I don't want to.

• We are going from a totally inside internal network focus to expanding to outside network communications. We are looking at security issues (viruses vs. access issues) which keeps us from using external network communications now.

• We are just trying to get things together to make our customers happy.

INFORMATION HIGHWAY ERA

White
Paper

that comprise it have a deep need to communicate. All businesses have customers or clients, and virtually all have significant relationships with not only their suppliers but also third parties such as banks, insurance and legal firms.

Over the last decade, electronic forms of communication have begun to replace regular mail and other paper-based systems, which have not been able to keep up with the pace of today's business activity. Business has come to rely on two electronic technologies: the computer and the fax machine. Figure 4 shows the relative use of these two technologies by major industry sector.

In the 1980s, the fax machine emerged as a simple, reliable and inexpensive means of electronic communications. And in the years since, it has become the dominant and ubiquitous mode of inter-enterprise communications in all sectors.

But despite its many benefits, in one way, the fax can be viewed as a step backward in terms of stimu-

lating electronic business communication.

Often sending of a fax message involves taking a document out of its digital form and converting it first to paper and then to the analog fax signal. In this process, the potential for the future processing available with an electronic messaging system is lost.

But this is why the transition from fax to true computer messaging will occur rapidly. In fact, the current market positions of these two technologies will likely be reversed over the next four years.

The industry patterns shown in Figure 4 mirror those shown earlier in this section. The banking, finance, retail, utilities, education and services sectors make the most use of computers; government, health care and manufacturing rely most on fax.

Together, figures 3 and 4 offer a snapshot of how different industries today use networks. There are other ways to view this issue, but further analysis supports the same broad picture of rising network importance and significant variations by sector. This is the context from which future plans are evolving.



The fax can be seen as a step backward in terms of stimulating electronic business communications.

FIGURE 4
Proportion of Sites Using Fax and/or Computer-to-Computer Communication
to Send Information by Industry

Large Businesses in the United States Surveyed

Industry	Sending Electronic Information				Total Organizations	
	Monthly Fax	Monthly Comp-Comp	Equal Use of Both	Don't Know		
Banking	41.1%	22.1%	36.8%	0%	100%	95
Insurance, Finance	48.9%	12.1%	37.4%	0%	100%	107
Process Manufacturing	68.1%	13.1%	20.2%	0%	100%	39
Discrete Manufacturing	74.2%	10.5%	15.2%	0%	100%	106
Retail	45.4%	23.7%	36.9%	0%	100%	87
Transportation/Utilities/Communications	51.5%	11.9%	34.7%	2.0%	100%	121
Government	62.2%	10.8%	18.8%	1.1%	100%	95
Health Care	72.8%	0.8%	26.4%	0%	100%	103
Business Services	42.5%	25.2%	32.2%	0%	100%	87
Education	28.9%	20.8%	52.8%	1.9%	100%	53
Other	38.4%	9.1%	34.5%	0%	100%	35
Total	55.4%	16.4%	27.8%	0%	100%	907

Source: International Data Corporation

Application Initiatives and Priorities

The primary goal of this research project is to understand the relative importance of internal and external IS priorities. To gain a full perspective, IDC examined customers' overall goals, their broad application and technology activity, and specific application initiatives. This section explores what customers are working on today, along with the implications for key application development, information access and communications technologies.

When it comes to IS priorities in terms of internal and external systems, it is no surprise that internal systems are dominant in 79% of the enterprises surveyed, or nearly four of five organizations. What is significant is that 21% give at least equal emphasis to external systems (with 3% making external systems a priority). This tracks well with the concep-

tual patterns shown in Figure 2, and is evidence that the industry has truly entered the early adopter phase of this transition.

Although industry patterns are not shown in this text, examination again shows that information-intensive industries are taking the lead, with the exception of the most internally focused sectors: government and health care. Banking, insurance and business services are the most likely to view external systems as their main priority.

FIGURE 5

Current IS Application Priorities

1 = not a priority, 5 = a top priority

INTERNAL	
Enhancing and Maintaining Existing Applications	4.2
Improving Employee Access to Internal Information	4.0
Internal E-Mail Systems	3.8
New Internal Applications	3.5
Re-engineering Existing Applications	3.4
EXTERNAL	
Applications Linked to Customers	2.8
E-Mail to Other Organizations	2.7
Employee Access to External Data	2.6
Applications Linked to Suppliers	2.4

Source: International Data Corporation

Application Focus

In this series of questions, IDC attempted to understand the relative importance of several broad application categories, with emphasis on internal vs. external application initiatives. Respondents were asked to rank each category, with 3 = top priority and 1 = not a priority.

Figure 5 summarizes the findings by key application category. However, bear in mind that this data shows only aggregate averages. Industry variations are important; the mean averages tell only part of the story.

The first five categories are internal in nature; the last four are externally focused. Since almost all customers have large internal investments, internal applications are still the highest priority for most, generally rating a full point above most external categories. However, closer inspection shows that external tasks have emerged as priorities for a significant portion of the survey base. Figure 6 looks at these same external categories. But rather than showing the average, or mean, response, it presents the percent of total respondents that rated the category either 4 or 5, the two highest priority ratings.

Viewing it this way, we see a much more positive

FIGURE 6

Percent of Customers With High Priority External Activity by Type of Application

Percent rating 4 or 5



Source: International Data Corporation

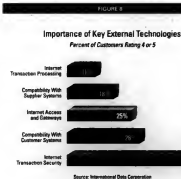
story, with 38% of all respondents providing a high priority ranking for systems that link to existing or potentially new customers. Further analysis shows that the most important types of customer applications are those that improve service, followed by attempts to reach new customers, with sales and marketing to existing customers being least important.

This data reinforces the view that a core group of more than 20% of large U.S. corporations is developing externally focused business. The percentage has reached some 60% in the case of business services and about 40% for retail and insurance. Overall, roughly a third of the respondents have little or no external priorities. This brings down the mean averages, but still leaves a great deal of activity among the remaining businesses surveyed.

Technological Implications

To build these applications, customers need a proven set of tools and solutions. Today, the choice of client/server suppliers often comes down to which vendors have the best combinations of platforms, development tools, management tools, applications solutions and customer service. Similarly, the inter-enterprise era will place new demands on suppliers in areas such as network gateways, wireless access, transaction security, applications engineering, overall management and extended enterprise support.

Rating technological priorities is another means of understanding current IS initiatives. In its survey, IDC asked respondents to rate technology types by their importance in meeting the application priorities described above. Again, a scale of 1-5 was used to rate importance, with 5 = very important and 1 = not important. Figure 7 shows the surveyed technolo-



gies and their relative ranking.

Again, the internal challenges score heaviest, often by a full point or more. That systems performance is still the highest rated category demonstrates that despite all the improvements from vendors in recent years, the need for faster systems is not going away.

Figure 8 extracts the relevant external technologies and, as in Figure 6, shows the share of respondents rating the technology a 4 or a 5, the two highest priority ratings.

The three Internet categories tell a consistent message. Unless security issues are addressed, current usage is unlikely to move beyond today's messaging and file transfer applications, although 11% of the respondents already show high interest in transaction processing on the Net.

FIGURE 7

Overall Importance of Key Technologies in Meeting Current Application Priorities

INTERNAL	
Internal Systems Performance and Response Times	4.3
Internal Systems Compatibility	4.2
Network Migration and Expansion	3.8
Client/Server Development Tools	3.5
Internet Security	3.1
EXTERNAL	
Compatibility With Customer Systems	2.7
Internet Access and Gateways	2.6
Compatibility With Supplier Systems	2.4
Wireless Network Access	2.3
Internet Transaction Processing	2.8

Source: International Data Corporation

Human Resources

New IS challenges lead to changes in human resource (HR) requirements. Many of the external applications described earlier will require different skills than ones developed to meet internal needs. Retraining staff, adding personnel, using consultants, and outsourcing functions are all part of the answer, but must fit in with current budget realities.

Figure 9 shows the overall IS staffing picture in

are making at least moderate use of the Net, and this usage will rise significantly in 1995. A third of U.S. businesses are quickly ramping up Internet use.

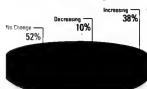
Some 83% of the respondents said that IS was wholly or partly responsible for managing the Internet in their organizations. More than one in three IS managers said their firm had someone responsible for Internet usage. Another 14% use consultants.

In other words, nearly half of large and medium-sized U.S. firms have dedicated Internet resources. IS clearly believes the Internet will be important. That belief is supported by survey questions dealing with IS attitudes toward the Internet. Of the respondents, 30% said they regarded the Internet as a major industry development and 43% called it an intriguing development being monitored carefully.

Only 21% deemed it a minor supplement to their networks. A mere 3% said it is of no real interest, and the same small number answered "don't know."

FIGURE 9

1995 Planned IS Staffing Levels



Source: International Data Corporation

these relatively prosperous times. IS staff is still increasing, with those adding staff outnumbering those reducing by nearly 4:1. The use of consultants and other third-party contractors is also on the rise.

Many early adopters are adding resources for more externally focused systems. Given the number of large and medium-sized U.S. corporations, that 26% are seeking Internet experienced staff translates into a huge HR opportunity.

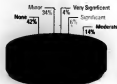
The Internet has facilitated low-cost inter-enterprise communications. Today companies use it for virtual private networking, file serving and sharing, groupware and remote system access.

The Internet has grown so fast that it seems an overnight success. As a result, its future is the subject of much speculation. But regardless of the fate of any one product, network or protocol, early adopters can leverage their experience and skills into whatever advanced networking environment emerges.

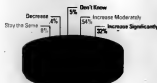
Although Figure 11 shows that business still views the Internet cautiously, some 25% of U.S. businesses

FIGURE 10

Current Use of The Internet



Expected Use in 1995



Source: International Data Corporation

Conclusion: The Movement Toward Electronic Commerce

The goal of the era of connectivity is not just to connect one enterprise to another but to transform commerce. Consider the impact that the shift from paper checks to electronic funds transfers has had on the efficiency of business transactions.

The transition to electronic commerce is of the same order of magnitude. At the minimum, the seamless flow of information between enterprises will give concrete meaning to the oft-cited "virtual corporation." Electronic commerce will blur organizational boundaries and create new entities designed to operate in the emerging frontier of cyberspace.

This scenario promises an exciting future. But how do today's businesses feel about these changes?

Despite all the unknowns, businesses view electronic commerce with optimism. Of the 1,000 businesses surveyed, nearly 600 say that electronic commerce will be important to them. Figure 13 shows business expectations over the next 24 months.

Given that five years ago, only 3% of businesses thought in these terms, this is a remarkably rapid move. Today, over 25% of 18 managers expect that electronic commerce will be very important or critical to their organizations.

Again, information-intensive industries are taking

the lead. Business services, banking and insurance will move fastest, followed by retail and utilities, then manufacturing. Government and health care seem destined to lag for at least the next few years.

Business that invested heavily in PCs, LANs and intra-enterprise message networks in the past ten years have gained competitive advantages over those that dithered. The competitive ramifications of this next wave will be even more compelling. Since most external activity will focus on better serving existing customers or finding new ones, businesses that master the new technologies will gain advantages faster than in the intra-enterprise computing era.

Over the past three decades, customers have spent trillions of dollars setting up the resources, skills and systems to make the inter-enterprise era possible. As business begins to be conducted electronically, the potential for productivity improvements is great.

The industry has long talked about marrying IT investments and business processes. Since the most important business processes relate to customers and suppliers, developing a highly inter-connected business environment should prove a key step in delivering on the industry's long-term promise. The next decade's opportunities are greater than ever.

FIGURE 13

Importance Level in 1994 of Electronic Commerce to Organization by Industry

Industry	Electronic Commerce						Total Organizations
	Critical	Very Important	Important	Minor	Not Important	Don't Know	
Banking	13.7%	15.8%	26.8%	23.2%	8.5%	1.1%	100%
Insurance/Finance	10.3%	21.5%	38.9%	23.4%	13.1%	.8%	100%
Process Manufacturing	9.1%	17.2%	28.2%	30.2%	13.1%	4.0%	100%
Discrete Manufacturing	4.8%	16.9%	31.4%	27.8%	18.2%	1.8%	100%
Retail	13.4%	18.8%	26.9%	23.7%	16.9%	1.8%	100%
Transportation/Utilities/Communications	10.8%	18.8%	28.7%	26.7%	13.9%	1.0%	100%
Government	3.2%	4.2%	27.4%	21.1%	42.1%	2.1%	100%
Health Care	7.8%	8.9%	23.2%	43.7%	15.9%	2.8%	100%
Business Services	26.4%	17.2%	33.6%	21.8%	6.9%	4.8%	100%
Education	9.4%	22.8%	26.2%	18.5%	17.8%	3.6%	100%
Other	14.5%	26.0%	25.5%	25.5%	12.7%	1.8%	100%
Total	11.4%	15.2%	30.5%	25.4%	18.8%	2.5%	100%

Source: International Data Corporation

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IS Priorities

As The Information Highway Era Begins

Desktop Computing

Adobe Systems, Inc. has announced Adobe Illustrator 5.5 for Silicon Graphics, illustration and page design software.

According to the Mountain View, Calif., company, Adobe Illustrator 5.5 lets users design titles for video and film, add text and illustrations to digital artwork, label maps and technical drawings and create brochures and original artwork on paper and the Internet. It has Adobe's PostScript language capabilities and lets users place and view EPS files from any source in an illustration.

Adobe Illustrator 5.5 uses the same file format on Macintosh, Silicon Graphics, Inc., Sun Microsystems, Inc. and Windows systems, which simplifies file exchange.

Pricing for Adobe Illustrator 5.5 for Silicon Graphics starts at \$895.

► **Adobe Systems**
(415) 962-2100

Silantia Technology, Inc. has introduced ApproveIT for Microsoft Corp.'s Word for Windows.

According to the Montreal company, ApproveIT lets users electronically manage the creation, revision and approval of documents, create and securely sign documents electronically and produce signed paper copies.

ApproveIT adds signatures to documents from a pen-based input device or a previously captured signature on file and uses password protection. It also ensures that document contents are preserved at the moment of signing; any revisions after the signing remove the signature.

ApproveIT costs \$140.
► **Silantia Technology**
(514) 368-1101

Micro Solutions, Inc. has announced a quick-speed CD-ROM drive backpack, Model 164700, with a built-in sound card.

According to the DeKalb, Ill., company, the CD-ROM backpack attaches to a printer port and does not require an interface card. It features a 16-bit sound card that allows 16- and eight-bit stereo playback and recording.

The product works with Windows-based multimedia applications.

The CD-ROM backpack Model 164700 costs \$950.

► **Micro Solutions**
(618) 756-3411

Envision Solutions Technology, Inc. has released Presto, software to manage scanning, filing, facsimile and copying paperwork on a PC.

According to the Burlingame, Calif., company, Presto combines image editing, optical character recognition (OCR) and document filing features. The product uses simple function keys for copying and filing images as well as delivering images into a word processor or an image editor. Photos and paperwork can be scanned directly into storage files without embossing resolution, file format, size

or color. Stored text can be converted later by choosing an OCR agent.

Presto lets scanner users work in black and white, grayscale or 24-bit color.

After an initial free trial period, Presto will cost \$149.

► **Envision Solutions Technology**
(415) 692-9861

Pierian Spring Software, in conjunction with Copernicus Software, has announced the Copernicus Collection of

Multimedia Images Vol. 1.

According to the Portland, Ore., company, this Macintosh CD-ROM product lets users of all Macintosh multimedia programs add photographic images to their work.

The collection contains 36 categories of more than 160 color photo images and graphics. It includes multimedia lessons, presentations, storybooks and reports. The collection costs \$99.

► **Pierian Spring Software**
(503) 232-2944

Product short

Okidata Corp. has introduced the Okijet 2010, a 600 dot/in. full-color ink-jet printer. It is PC compatible with Windows 3.1 or later systems and can handle transparencies, index cards, labels, card stock and stock papers. Price: \$400. Okidata, Mt. Laurel, N.J. (800) 235-2000.

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Source: Survey of **COMPUTERWORLD CD** subscribers, May 1993.

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Workgroup Computing

ELECTRIC UTILITY TAPS EOS
TO MANAGE LAN SPREAD, 52
VENDORS COMMIT TO
DIRECTORY SERVICES, 53

Vines builds close ties with Windows desktops

By Laura DeLo

While the sometimes tenuous requester/redirector connectivity issues between Microsoft Corp.'s Windows NT and forthcoming Windows 95 and Novell, Inc.'s NetWare have grabbed most of the headlines, Banyan Systems, Inc. has quietly forged strong links between its Vines network operating system and Windows desktops.

Banyan officials said the Westboro, Mass., firm's close working relationship with Microsoft has resulted in early software releases that allow Windows desktops to access all Vines file and print and StreetTalk directory services.

Banyan has been shipping a client redirector for Windows NT Server-based workstations since April 1994, said Steve Petrofsky, director of product marketing for Banyan's Enterprise Network Services (ENS) Platform Business Unit. The Banyan client currently supports Windows NT workstation Version 3.5 and will support 3.51 when it begins shipping next month, he said.

This is stark contrast to Novell, which is due to ship its NetWare client requester for Windows NT 3.5 and 3.51 in early June [CW, May 8].

A step ahead

And judging by its head start, Banyan may well beat Novell to the punch in shipping a client redirector for the upcoming Windows 95 platform. Novell is not expected to ship its first beta requester for Windows 95 until early July.

Petrofsky and Tom Simstein, Banyan's workstation section manager for the ENS Platform Business Unit, said Banyan has already shipped two beta releases of its Vines client redirector software for Windows 95 since January under the company's so-called Early Access Program (EAP).

The current EAP 2 Vines client redirector for Windows 95 incorporates the Vines protocol stack, which is the basic shell integration component to handle file, print and user displays at the Windows

95 graphical user interface, and a StreetTalk Browser to allow users to access all Vines resources from their desktops, Simstein said.

Early beta users of EAP 2 report the Banyan client redirector for Windows 95 generally works well but has some limitations.

"I haven't been able to use the Network Neighborhood or control panel function that lets me browse Vines resources. When I click on it, I get error messages," said a network administrator at a large East Coast financial institution who requested anonymity.

Other users on Banyan's forum on CompuServe have complained about the complexity of the Network Neighborhood browser and have asked Banyan to develop an enhanced version of the "hood" that allows them to view the "hood" that allows them to view the "hood" for just one specific service—either file, print or StreetTalk—at a time.

Petrofsky and Simstein said Banyan is aware of these limitations and is working with Microsoft to overcome them by the time Windows 95 ships in late August.

Round three

Possibly the third and most likely beta version of the redirector—EAP 3—is set to ship this week, Petrofsky said.

"EAP 3 is more finely tuned, and we've achieved such a high level of stability that we've removed the debugging code," Petrofsky said.

The removal of the debugging code is a sure sign that Banyan's software is ready for prime time.

That is not to say that all will be smooth sailing for Windows 95 desktops attached to Vines networks. As with any major new release of the Windows operating system, "initially, glitches will occur and it will take a bit of time to work out all the kinks," Petrofsky and Simstein said.

Banyan packages its client redirector software for Windows NT and Windows 95 with both its core Vines and ENS offerings. Windows 95 customers who have purchased Banyan's VIP services automatically get a free upgrade.

Intel: P6 to drive servers

Chip to lead company to heart of enterprise computing

By Jalkumar Vijayan

With the coming P6 generation of chips, Intel Corp. is hoping to do in the server market what it did in the PC market—drive mass volume through hardware commoditization.

For users, the advent of the next-generation Intel chip—scheduled to ship in the third quarter—is expected to result in low-cost, highly standardized PC servers that can run shrink-wrapped multiprocessing operating systems from a wide variety of hardware vendors.

The 5.5 million transistor chip—today's Pentium has about 3.1 million—will initially be available in a 133-MHz version. It will have a performance estimated at 200 SPECint86—a benchmark for measuring integer performance. In comparison, Intel's current 100-MHz Pentium processor has a performance of about 110 SPECint86.

The chip has been designed from the ground up for the server market and is expected to be widely used in multiprocessor and clustered server implementations, analysis said.

Quad-processor systems based on the chip will scale up to 1,500 transactions per second compared with about 620 transactions per second in current high-end servers, Intel said.

"The message that Intel wants to put out is that it is possible to scale the P6 across the enterprise," said Dean McCarron, an analyst at Mercury Research, Inc. in Scottsdale, Ariz.

San Jose, Calif.-based Intel is currently sampling the chips with some vendors. The

company has put in place an aggressive plan to standardize reference designs, motherboards and finished systems based on the P6 processor, according to David House, senior vice president of Intel's Server Group.

For instance, Intel will make available on an OEM basis fully finished multiprocessor server systems, called Extended Expressors, based on the P6 processor. Systems vendors can label and sell the systems as their own.

Analysts say they expect Intel's business model to result in a flood of relatively low-cost, standardized, single- and multiprocessor servers and workstations. High-end workstations and servers are expected to hit the market at almost the same time that Intel announces the processor. Desktop systems based on the processor are also due out by year's end.

In fact, "multiprocessor P6 desktops will be

A standard P6 server includes the following:



- four CPUs at 200 SPECint86
- Up to 1,500 trans./sec.
- 256K-byte cache per CPU
- Up to 2G bytes of memory
- Up to 100G bytes of hard disk capacity
- RAID support

available for less than \$5,000," predicted Martin Reynolds, an analyst at Dataquest, Inc. in San Jose, Calif.

"What matters to us most are standards," said Don Coon, a business analyst at PPG Industries in Pittsburgh. "So long as I can't tell the difference between a system that has an Intel processor in it and one that doesn't, then the processor wouldn't matter."

Speeding it up

Intel's next-generation P6 processor is expected to significantly boost performance over current chips.

Intel said systems based on the P6 processor will deliver almost twice the performance of today's fastest Pentium chips. At its heart is an innovation known as Dynamic Execution, which is Intel's collective term for the following three technologies: a Multiple Branch Prediction refers to the processor's ability to look steps ahead in the program and predict which groups of instructions will be processed next.

• **Dataflow Analysis**, where the processor checks the instructions to see if they are dependent on other results and then prepares an optimized list of instructions.

• **Speculative Execution**, where the optimized instructions are then carried out speculatively.

Apart from the core CPU itself, the P6 will deliver higher performance because of its system interface, according to the "Microprocessor Report," an industry newsletter. The P6 connects directly to a system-level cache in the same package as the CPU.

Multiprocessing is enhanced when a new data bus, called the Packet Bus, is combined with the packaging of the chip.

—Jalkumar Vijayan

Electric utility taps EDS to manage LAN spread

Pennsylvania Power & Light signs five-year cooperative agreement

By Patrick Dryden

By the time one-fourth of Pennsylvania Power & Light Co. (PP&L) users converted to LANs, chaos threatened the utility's shift to a distributed computing environment.

From the information services department's perspective, preparing workgroup PCs proved difficult and time-consuming. And support demands skyrocketed for users and administrators who had to master new technologies. Management and cost were decentralized as divisions pursued their own re-engineering projects.

The \$2.7 billion electric utility serves central eastern Pennsylvania—10,000 square miles and 1.2 million customers.

"We did very well when PP&L was entirely based on the mainframe, but we're inexperienced in the distributed environment," said Russell Clelland, manager of treasury operations. "We lacked the support staff to move into client/server applications and build the PP&L network ourselves."

Without control, information systems managers said they felt unable to assure core network services for the 4,000 em-

ployees in the Allentown, Pa., headquarters and 2,000 other users spread throughout five remote sites.

This month, PP&L will try to regain control of its client/server migration by assigning certain management tasks to Electronic Data Systems Corp. under a five-year cooperative agreement.

"EDS augments our staff by bringing in expertise we didn't have," said Mike Hill, vice president of information services. "This deal lets our people stay more involved in decision-making while learning from EDS."

Service provider

PP&L started rolling out network services last October by supporting client/server initiatives started in every part of the company.

"Our financial applications must be consistent enterprise-wide, so we tried to be in tune with corporate IS," Clelland said. "Some other departments were less concerned."

Plans called for a shift from an IBM SNA network to a TCP/IP network and a move from centralized mainframe resources, management and electronic mail to dispersed Novell, Inc. NetWare 4.0 servers linked by NetWare Directory Ser-

vices (NDS) and Hewlett-Packard Co.'s OpenView manager and OpenMail.

Soon PP&L began looking outside for help.

The company started down the outsourcing path to speed the delivery of these services to its customers, Hill said. Getting a PC on a desk and connecting it to the network took too long. Then, the task of supporting and remotely managing workstation became a problem.

"The LANs in place were all locally managed. Without remote observation, we weren't able to begin keeping up with their spread," Hill said. "Much support was done locally by units, so we didn't really know what this network was costing us."

Enter EDS—gratefully, unlike its reputation for data center takeover.

"Maybe I didn't know all the prejudice toward EDS, but they were willing to approach us in a flexible way," Hill said. "That was a deciding factor."

His staff of 200 will work side by side with EDS to master new technologies in the move toward centralized management of the new network. "EDS is focused on infrastructure support and involved in our re-engineering projects," Hill said.

EDS keeps active

EDS participates in various planning committees, performs design reviews, then acquires and installs the hardware and software. From a network control center at PP&L headquarters, EDS provides help desk and maintenance crews.

After-hours phone support will be provided by other EDS distributed systems management centers [C.W. May 1].

Management tasks include administering NetWare 4.0 users, servers and the underlying NDS, maintaining the new LAN-based E-mail system; supervising internet connectivity; and monitoring the hubs, routers and WAN links.

Hill would not put a price tag on the services provided by Plano, Texas-based EDS, but he said "it makes fiscal sense to have them do this."

Clelland said he expects the deal to help his group implement a client/server-based remittance processing system with better responsiveness and a higher level of service.

"I don't think we could have rolled out the PP&L network without EDS helping us install and manage it," Clelland said.

Sharing the burden

PP&L Retains responsibility for distributed systems environment and re-engineering projects.

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SCO to ship OpenServer 5

By Jean S. Borman

To claim its Everest, The Santa Cruz Operation trekked from its base camp in California all the way to New York.

The new SCO Unix operating system, code-named Everest for its high degree of scalability, was officially renamed SCO OpenServer 5 at a New York press conference. Pricing ranges from \$1,296 for a five-user enterprise system license to \$2,590 for a 25-user license.

OpenServer 5 is an application server that SCO hopes can defend its high-altitude turf against incursions by two competing Unix-on-intel server products, Novell, Inc.'s UnixWare 2.0 and SunSoft, Inc.'s Solaris 2.4. OpenServer 5 is expected to ship monthly's end.

SCO enhanced its SCO Unix 4.2 operating system to support up to 30 Intel Corp. CPUs; the largest Intel servers sold with SCO Unix now have only up to eight CPUs.

As SCO moves to higher ground in enterprise server systems, it will face stiff competition, analysts said. "All the Unix workstation vendors are coming out with SMP products this year, and SCO is antea-

gung up," said Greg Weiss, a research analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y. Microsoft Corp. also is pushing into the PC/LAN server market with Windows NT, hoping to displace Novell's aging NetWare 3.x servers.

Some of SCO's target users said improved security, performance and reliability will help them upgrade systems.

"I think it's intended to be more upscale and more expendable," said Bob Kostusky, director of core technology at Rite-Aid Corp. The Harrisburg, Pa., pharmacy chain has 2,800 Intel PC servers running SCO Unix, and its round-the-clock operations would benefit from OpenServer 5's high-availability features, he said. Kostusky said he plans to start using OpenServer 5 in a few pilot sites by July and deploy it widely in 1996.

Taco Bell Corp. in Irvine, Calif., has been testing OpenServer 5 since November and plans to replace SCO Unix software on aging Intel 8086 servers in some of its 4,000 restaurants. Symmetrical multiprocessing then are appealing as upgrades for the chain's PC processors, said John Nabours, manager of restaurant information technology.

Vendors commit to directory services

By Sarah M. Mohan

Seeking to capitalize on a heterogeneous electronic-mail market impatient for integration, WorldTalk Corp. has announced Open Directory Server, a standards-based server designed to keep data from several sources in one repository. Los Gatos, Calif.-based WorldTalk will license the X.500 source code from ICL Enterprises North America in Washington.

WorldTalk is graduating from pure directory synchronization products to providing full-fledged X.500-based directory services that include security, a single address and replication. The announcement also puts WorldTalk in direct competition with bigger players and their products, such as Lotus Development Corp.'s Lotus Messaging Switch and, perhaps later, Microsoft Corp.'s Exchange Server.

Will be part of the system

"All vendors are committed to providing directory services," said Ron Rasmussen, vice president of Creative Networks, Inc. in Palo Alto, Calif. "Microsoft domain services will do three quarters of what X.500-compliant directories will do. It is very competitive," he said, adding that over the long term, users will be unwilling to pay for directories because they will become part of the operating system. But for now, he said, "It does fill a vacuum."

Open Directory Server is based on the International Telecommunications Union's X.500 standard for directory services that allows users to do name/address resolution and queries. The X.500 technology that WorldTalk is licensing from ICL supports all the features of the 1988 version and some features of the 1993 X.500 version, including security, authentication and replication.

Dave Atlas, vice president of marketing at WorldTalk, said the Open Directory Server is a layer on top of the Directory Synchronization Services that, as the name suggests, merely provide synchronization among disparate E-mail directories. ICL's X.500 engine will sit atop LAN E-mail systems and will be able to communicate with non-E-mail directories such as private branch exchanges and human resources databases.

The Open Directory Server will give users more information. For example, if users have the appropriate rights, they will

be able to look up a person's title, salary and manager.

Previously, WorldTalk had been a competitor of Hitachi Computer Products America, Inc. in Santa Clara, Calif. Hitachi's SyncWare product line, like WorldTalk's Directory Synchronization Services, provides user directory synchro-

nization. It works in environments that need only synchronization and not a unified directory.

A possible limitation of the Hitachi offering, however, is that it handles only directory synchronization, said Rick Drummond, president of Drummond Group in Fort Worth, Texas. He said Hitachi as-



sumes different E-mail systems within an enterprise are already able to communicate, so only their address books need to be synchronized.

The next logical step for Hitachi, Drummond said, might be to provide directory services that let users view all names in a central directory rather than of just those users who are on the same system.



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Enterprise Networking

TAKING A BYTE OUT OF
COMPUTER CRIME, 56
MICROCAM UNVEILS REMOTE
SOFTWARE FOR WINDOWS 95, 60

3Com's LinkSwitches relieve bandwidth ills

By Laura Ditto

3Com Corp. bolstered its portfolio of stackable Ethernet switches recently with the addition of three workgroup offerings.

The switches, part of the SuperStack family, offer full 10M bit/sec. and 100M bit/sec. speeds and aggregate bandwidth ranging from 130M bit/sec. to 310M bit/sec. on each hub. List prices start at \$199 per managed port.

The new wires are named the LinkSwitch 1000, LinkSwitch 2200 and LinkSwitch 3000. They are targeted at workgroup users who want to relieve bandwidth bottlenecks on their workgroup LANs and servers as they add more users and more demand-intensive applications, said Ron Segr, vice president and general manager of 3Com's sub-division.

Longtime 3Com user Steve Lopez, network manager at the National Board of Medical Examiners in Philadelphia, gave 3Com's gear a thumbs-up for its robust functionality and unfailing reliability.



"I can always count on 3Com equipment to deliver what they promise in terms of throughput and performance."

— Steve Lopez, National Board of Medical Examiners

"I can always count on 3Com equipment to deliver what they promise in terms of throughput and performance," Lopez said. "Switching is becoming increasingly important in our environment because we are the repository for medical exam records nationwide, and that type of data exceeds a lot of bandwidth. The LinkSwitches ensure that our network performance is optimal."

John Houston, vice president at Applications Profile, Inc., an employment services company in St. Petersburg, Fla., is another veteran 3Com switch user. He is also beta-testing the new switches and gave them high marks.

New switches from 3Com			
Product	Ports	Availability	Price
LinkSwitch 1000 Ethernet	24 10M bit/sec. ports, one switched 100M bit/sec. port, one "fast" Ethernet port and optional "fast" Ethernet port	July	\$4,975 list price
LinkSwitch 2200	16 switched Ethernet ports and one 100M bit/sec. FDDI port	May 30	\$635 per port; \$6,995 for system
LinkSwitch 3000	Five fiber-based "fast" Ethernet ports, one twisted-pair "fast" Ethernet port and an optional "fast" Ethernet port	December	Less than \$20,000

Symplex simplifies routing

DirectRoute connects LANs via ISDN lines

By Michael Fitzgerald

With the crush of vendors in the routing business, how long will it be before you can get a free toaster and some extra bandwidth for your network when you open a new checking account?

We will not make any predictions, but internetworking vendors such as Symplex Communications, Inc. in Ann Arbor, Mich., are working hard to boost bandwidth for users.

Symplex recently introduced its DirectRoute Remote RD-1, a \$1,300 router targeted at remote users and small offices. DirectRoute Remote ties Ethernet LANs to main offices via Integrated Services Digital Network (ISDN) connections. Simoes Iler, director of engineering at Symplex, said companies that use DirectRoute Remote with ISDN lines will save significant amounts of money over leasing 56K bit/sec. lines.

Symplex, page 58

Skip MacAskill, senior research analyst at Gartner Group, Inc. in Burlington, Mass., said the switches represent 3Com's attempt to make layoffs into the workgroup switching market — to which Cisco Systems, Inc.'s Kalpana division had been the only supplier.

MacAskill said he expects 3Com to be a major player in both the high and entry level of the LAN

switching market. "They optimize each device and deliver lots of functionality at a cost-effective price," he said.

3Com has optimized the LinkSwitch family with embedded Remote Monitoring/Network Management information Base (MIB) agent support initially for the first four MIBs: alarms, statistics, events and history.

Security product wave challenges users

Users are seeing a proliferation of network security "solutions," but those offerings come with a tough problem: how to evaluate the products and match them with requirements that are growing ever more complex.

In just the past two weeks, various vendors have announced products for Internet security, virus protection, access control, intrusion detection and more (see below). The products are being demanded by users who are more security-conscious, said Marc Zorn, a network security specialist at TRW, Inc. in Redondo Beach, Calif.

"Also, the complexity of what people are doing with networks is going up. World-Wide Web, gobble desktop conferencing — all these things they weren't doing five years ago," Zorn said. "Since they are more com-

plex, there is more potential for security problems."

The need for security products increases as systems become more distributed, and yet distributed systems are often unprotected, said Andrew Toner, senior manager at Price Waterhouse in New York. "These systems were not set up for valid business reasons, but the people building them had no real understanding of security," he said.

"Some of the Unix environments don't allow you to implement controls that easily, so you need multiple products to really secure yourself," he said.

Zorn said the quality of new security products is generally good. "The problem is there aren't enough of them and not enough of them at a reasonable price," he said.

— Gary H. Ahrer

Security roundup

Computer and network security products announced this month include the following:

Company	Product
Anent Technologies Rivoli, Md.	OmniGuard/EAC for PCs, which uses encryption to protect Intel-based PCs against unauthorized access. OmniGuard/SecureExchange, encryption-based software for secure E-mail and messaging.
CIS North America Pittsburgh	NC-Pass LAN Distance, software to add security to users of IBM's LAN Distance product for remote LAN access.
Digital Maynard, Mass.	Digital Firewall Service, customized Internet security software and consulting service for large, multios environments. Digital Firewall for Unix, a single-system, preconfigured software package for midrange security. BorderWare Firewall Service, an entry-level firewall and Internet server.
Intrusion Detection New York	Kane Security Analyst Version 2, uses expert rules to assess and report the security of Novell NetWare 4.x and 3.x LANs.
Los Alamos Technology Los Alamos, Calif.	Gabriel, detects unauthorized network probes from SATAN, the Security Analysts Tool for Auditing Networks.
McAfee Associates Santa Clara, Calif.	NetShield 2.2 for NetWare and VirusScan 2.2 for DOS, Windows and OS/2, new releases of virus scanners with improved performance and ease of use.
Netscape Schaumburg, Ill.	Established the Information Security Solutions unit to provide products and services for network security. A "key escrow" product lets companies keep on file the encryption keys used by employees.
Penomona Concord, Calif.	Temple, software and services for secure electronic data interchange over open networks such as the Internet.
Security Dynamics Technologies Cambridge, Mass.	ACE/Server and SecurID Card, "smart card" technology for user authentication in Oracle-based client/server networks.

Taking a byte out of computer crime

Federal computer crime czar speaks out

Scott Charney, chief of the Computer Crime Unit in the Criminal Division of the U.S. Department of Justice in Washington, said he is challenged by outdated laws and smarter cyber-crooks. But he recently told *Computerworld's* Gary H. Anthes ways corporate America could make his job easier:

Q What major trends in computer crime are you seeing?

A As the Internet becomes a more broad-based communications device, we are going to see it abused like the telephone is abused. People are offering products for sale that they don't have, for example.

Most of our earlier cases were of young hackers exploiting the Internet.

Then we saw a shift — they moved from the explorer to the criminal element. As hackers get older, they become more profit-oriented. An increasing number of people are perpetrating crimes and doing damage.

Q What advice do you have for corporate America?

A Commercial use of the Internet will really spur the use of cryptography. Also, we need to move away from the use of reusable passwords, which are so easily compromised. We're also looking at other ways to authenticate users, such as biometrics.

Q Why are so many users apparently unwilling to adopt better security practices?



"For a long time, hackers felt they were off-limits. Now they are going to jail."

— Scott Charney, chief of computer crime unit, Justice Department

A It's both an awareness and a cost problem. Let's say you go to your upper management and say, "We need \$5 million for more computer security." Management is looking at the bottom line. They can give employees raises and make them happy, or they can put it toward something like encryption and nobody sees it; there is no apparent benefit to the workforce.

Q Companies often do not report computer crimes, hearing bad publicity. Is that wise?

A There is a fair amount of nonreporting of computer abuses. But there are important reasons to report these crimes. Sometimes, absent a criminal prosecution, you will not stop the attack.

If you just shut the door [to your network] and close him out, there are two problems. First, hackers often put back doors into systems. So if you shut him out through the front door, it doesn't mean he's gone away, you just don't know where he is anymore.

Also, if you just change the lock, you've just sent him to your neighbor. Although you can say, "At least he's not attacking my company," if all companies take that view, it doesn't help anyone.

Q Various federal agencies and industry people are working together to develop a set of Generally Accepted System Security Principles. Will that help corporations?

A There are some very important legal implications. There have been

suits for negligence. What constitutes a reasonable standard of security? It's not clear now. But if the principles are passed and a standard is created, failure to live up to that standard will reek of negligence.

Q There has been an "anything goes" attitude on the Internet. Is that changing?

A For a long time, hackers felt they were off-limits. They thought, "Law enforcement doesn't understand this, and our chances of getting caught are nil."

Now they are going to jail. The Legion of Doom went to jail; Masters of Deception went to jail; Kevin Mitnick is sitting in a prison. So the whole attitude on the net has changed.

Law enforcement is here to stay, and if corporate America supports that effort, it sends the right message.

Q Where do you stand on the administrator's "Clippy" proposal [in which the government could use cryptographic keys held "in escrow" in unbreakable the coded messages of criminals]?

A If everyone were law-abiding, we could give everyone complete anonymity and unbreakable encryption and say, "Fine, people don't hurt other people."

But that's not what happens. The government is saying encryption is a good thing, but law enforcement access — with a court order — is preserving society's right to make sure that we can get at the content.

Crime and punishment

Computer crime czar Scott Charney said the laws under which he works need to be updated. "There's no question that applying existing laws to emerging technologies is a difficult challenge," he said.

For example, Charney said the following laws offer criminals loopholes:

- The Computer Fraud and Abuse Act makes it illegal to access a computer without authority in access financial records such as credit reports, but it does not offer the same protection to computers holding nonfinancial data.

- The Copyright Act proscribes unauthorized copying of software and other protected property for financial gain. But MIT student David LaMacchia recently escaped conviction on charges that he ran an electronic bulletin board that others used to steal software because it could not be shown that he gained financially from the activity.
- The Interstate Transportation of Stolen Property Act covers only physical goods.

"We had a case where source code was stolen, taken across state lines, and the court said that it's not covered because it's an intangible property," Charney said.

Charney said he hopes to have legislative proposals to eliminate these gaps on Capitol Hill this year. — Gary H. Anthes

Cisco catches up by adding APPN

By Michael Fitzgerald

Like some Hollywood-type trying to make Internet fashionable, Cisco Systems, Inc. last week trumpeted its arrival in the Advanced Peer-to-Peer Networking (APPN) party.

San Jose, Calif.-based Cisco follows major competitors such as 3Com Corp. and Bay Networks, Inc. in building APPN into its routers. APPN is IBM's next-generation networking protocol. Along with LU6.2, APPN lets mainframe users connect IBM SNA systems to LANs.

Cisco will add APPN to all of its routers from the 2500 class product and up starting "probably in August," said Betty Huber, Cisco's IBM internetworking product manager. List prices will range from \$600 to \$8,000, depending on the class of router selected.

Huber said Cisco's Internetwork Operating System (IOS) will

gain the following three elements of APPN:

- Basic APPN Network Node support, including Dependence Logical Unit Registrar (DLUR) support. This support lets SNA traffic flow over an APPN network.
- 3270 traffic support (IBM Class of Service).
- Channel support for APPN, which lets information come from the LAN into the mainframe.

Still to come in a second stage, expected this December or January 1992, Cisco says it will add high-performance routing to IOS.

As far as being late, "We think what's out there isn't worth catching up to," Huber said. She said that Cisco, by coming to market after all of its most significant competitors, was able to support LU6.2 and DLUR, which she thought would make a difference for Cisco

in the market.

Huber also said Cisco had given IBM users a choice by waiting until these features were ready. "IBM customers don't need to rely on IBM" for SNA migration, she said.



No harm done

Analysts said Cisco's tardy arrival to the market would probably not hurt it because many IBM customers have been reluctant to move to the LAN protocol.

"Things just don't change overnight" in SNA shops, said John DePietro, an analyst at International Data Corp. in Framingham, Mass. DePietro said SNA shops have been slower to move to APPN than might be expected in part because router vendors have been slow to deploy it, so the Cisco move may help boost that.

At the same time, few analysts said they expect to see the APPN market explode with growth.

Symplex simplifies

CONTINUED FROM PAGE 56

"It's the bandwidth-on-demand concept," said Kathryn Korostoff, president of SDC Research, Inc., a market research firm in Natick, Mass. Korostoff said using ISDN means users get higher bandwidth when they want it without having to pay for a leased-SM line.

Korostoff said she said the Symplex products falls between low-end ISDN adapter cards and high-end routers that have ISDN modules.

Users contacted said they liked the ISDN capabilities.

"These allow remote users using a fairly inexpensive dial phone line to feel like they're almost working on our Ethernet LAN in the office," said John Williams, executive director at Peterson, Williams & Bizer, Inc. in Ann Arbor, Mich. Brian Miller, a technical consultant at Auto Concepts in Troy, Mich., said while Symplex's routers require Symplex products at both ends, he is impressed with the product.

"When they came out with ISDN, nobody had a standard — everybody got stuck with locked-in stuff," Miller said. He said Auto Concepts uses routers from other companies as well, and Symplex's support and product quality stands out.

One valuable aspect of Symplex's support is the company's knowledge of ISDN contacts at the telephone carriers. Symplex will make the phone calls to connect users with the appropriate people at the telephone companies, helping smooth the most difficult part of moving to ISDN.

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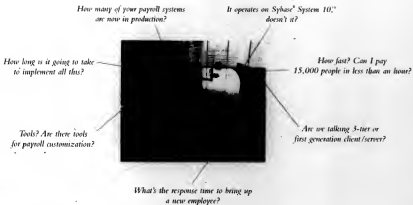
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Race to provide Win 95 products heats up

Microcom tries to jump ahead with Carbon Copy 3.0, offers improved remote control capabilities

By Mindy Bladgett

By releasing an updated version of its remote access software, Microcom, Inc. recently joined the pack of vendors racing to provide products for Windows 95. Mi-

crosoft Corp.'s new 32-bit operating system.

With Carbon Copy for Windows 3.0, the Norwood, Mass., company is aggressively trying to regain attention from the marketplace.

"Some products leaptfrogged over us," acknowledged Tom May, Microcom's senior product marketing manager for Carbon Copy. "With this product, we are trying to leaptfrog them. We have put a lot of engineering dollars into this, and we

have a very competitive product."

In particular, May touted Carbon Copy 3.0's remote file transfer and synchronization capabilities, which are two to five times faster than its predecessor, as well as its support for Windows 95. May said internal testing showed that Carbon Copy 3.0 has more remote control speed than its competitors, including Symantec Corp.'s PCAnywhere.

Carbon Copy 3.0 will ship on June 15 at an expected street price of less than \$120. It is compatible with Windows 95 and offers more than 100 new features.

Current users of Carbon Copy products or users of other brands of remote communications software can upgrade to Carbon Copy 3.0 for \$49.

The product offers two-way remote drive access, remote printing, graphics card compatibility and multi-level security.

New and improved

Paul Bowman, president of Telemagic, Inc. in Thousand Oaks, Calif., a service company that installs and sells telephone systems, said Carbon Copy 3.0 makes it faster and easier to reach service workers.


"The file transfer is intuitive," Bowman said. "The remote drive mapping is really handy. This means that a lot of our people don't have to come in to do paperwork. We just map and send them the information, and it works really well."

Elizabeth Ringe, an analyst at International Data Corp. in Framingham, Mass., said Microcom faces stiff competition from a market recently flooded with upgraded remote access products.

For instance, PCAnywhere has gained market share in the past several months. "It has been a very busy time for remote control products. There has been a whole flurry of products coming out at once," Ringe said.

Internal testing showed that Carbon Copy 3.0 has more remote control speed than its competitors, including Symantec's PCAnywhere.

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Large Systems

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NEW PRODUCTS, 65

Kaiser prescribes on-line patient care

Middleware to link systems, medical facilities

By Craig Stedman

The message is about to become the medium at Kaiser Permanente Foundation Health Plan, Inc.'s Northern California hospitals and medical offices.

In an effort to create a single pool of patient care data that can be accessed from any facility, the huge health maintenance organization is embarking on a series of distributed computing projects using IBM's MQSeries messaging middleware as a common thread for application-to-application communication.

Kaiser's goal is for patients to be able to go to any of the plan's 17 hospitals and 30 offices in the area "and logically it looks like the same facility" they usually visit, said Jerry Kong, project leader for data and systems integration. "That

hasn't been the case up to this point."

New medical records will be kept on-line in a DB2-based clinical data repository built during the past two years, Kong said. Kaiser, which has about 2.5 million subscribers in its Northern California region, plans by September to open up widespread mainframe terminal access to the repository, he added.

Different applications on mainframes and other large systems in Kaiser's data center are feeding data into the repository, and MQSeries eventually will be called on to handle about 1 million messages per day, Kong said. It is doing 10,000 messages a day now during a controlled-access shakedown period.

Total recall

In the next few weeks, Kaiser's hospitals will also start piloting two MQSeries-based applications that will let different groups of doctors and nurses get hospital admissions data and pathology results via PCs or notebooks.

Those are expected to lead into the development of a comprehensive three-tiered system that would replace dumb terminals with PCs tied into Unix servers, which

would be linked to the DB2 repository by MQSeries, Kong said.

The three-tiered system should be ready for limited pilot use in early 1990, according to Kong. Eventually it will be able to download data from the repository only for display purposes, but Kaiser eventually wants to make it a two-way street, he said. Then, instead of



having to order prescriptions, X-rays and laboratory tests by paper, doctors could do it on-line and have the requests routed to the proper departments by MQSeries.

MQSeries is an asynchronous messaging product that stores communications such as data updates and requests in queues and routes them between applications running on different systems. Because it is asynchronous, the IBM software does not require a live connection to be in place when it issues a call, and the requesting system can do other processing while waiting for a response.

Up and coming

So-called message-oriented middleware such as MQSeries is just starting to emerge into wide usage. Early adopters have primarily been large mainframe shops with lots of money and heavy-duty programming skills, said Sally Casark, an analyst at The Stanshield Group International, Inc. in Dennis, Mass.

Upward bound

Total worldwide sales of message-oriented middleware are expected to rise from about \$50 million in 1989 to \$60.5 million this year, according to projections by The Stanshield Group International. By 1997, the market should grow to the \$225 million range, according to Stanshield.

"These are expensive and sophisticated products," Casark noted. "You're not going to get Powersoft GUI developers to do an MQSeries project." Such tasks as configuring queue managers and creating message headers across multiple platforms require the kind of technical savvy found in MVS shops, she said.



Indeed, Kaiser initially wrote its own custom queuing software, and for now that still handles most of the data transfers in to the DB2 repository, Kong said. However, the custom code "was difficult to do and difficult to maintain," especially as different systems were added to the mix. MQSeries also held out the promise of more reliable and faster queuing performance, he added.

Winding road

Kaiser began working with MQSeries in 1983 and started using it last August to transfer immunization data from one mainframe to another one that holds the repository. Hospital admissions and discharges were added in April, and other applications including lab testing, prescriptions and outpatient registration should all be on MQSeries by the third quarter, Kong said.

Until now, each application was an island that could be updated and accessed only from its own set of proprietary terminals. For example, the lab testing system runs on Digital Equipment Corp.'s VAX hardware, while prescriptions and outpatient registration are on Tandem Computers, Inc. Guardian machines. Other applications are mainframe-based.

The MQSeries projects will solve that problem and should reduce Kaiser's reliance on paper charts that require additional warning to be transferred from facility to facility in time for patient visits. However, historical records will not be backlogged into the data repository, Kong noted. "There's just so much paper out there that it would be a huge effort to convert all that."

On-site

Kaiser Permanente Foundation Health Plan, Inc. Northern California region Walnut Creek, Calif.

Goal: Create a single pool of patient data on its 2.5 million subscribers that can be accessed from PCs at any of the plan's medical facilities.

Strategy: Implement a series of distributed computing projects that use IBM's MQSeries asynchronous messaging middleware to handle communications between applications running on different systems.

Status: MQSeries is routing a limited amount of data into a new DB2 repository. Full usage is expected by September.

Five target markets make the cut at Digital

By Neil Weinberg

Digital Equipment Corp. has narrowed its software development focus to five key market areas, as the company's overall software strategy continues to take shape.

Middleware, network integration, groupware, network and systems management, and advanced technology are the horses that Digital is placing its bets on, according to Nancy Strecker, vice president of software products.

Two weeks ago, Digital addressed the operating system level by announcing that it plans to integrate OpenVMS with Microsoft Corp.'s Windows NT. Now that Digital has defined the layered software architecture it plans to concentrate

on, the only remaining question is the fate of more than 100 other Digital software titles.

"Basically everything else is up in the air, and if that which is up in the air is living outside the law of gravity, it's not going to go for very much longer," said Terry Shannon, an analyst at Illuminata in Hollis, R.I.

Many of Digital's vertical applications — except in markets where Digital is a top player — are headed for either retirement, sale or a partnership arrangement in which a third party assumes development responsibility, he said.

"It remains to be seen what the software portfolio will look like," Shannon added. But it is clear that "some applications are going to get shot."

Digital, page 64

Coming into focus
Digital has identified some software and technology it will keep but has not revealed the fate of other products

KEEPERS

•Middle applications

- ObjectBroker
- DECAccessWorks
- DECmessageQ

•Network integration

- Pathworks
- ManageWorks

•Groupware

- LinkWorks
- TeamLinks
- All-in-1
- MailWorks

•Network and systems management

- Polycenter NetView
- Polycenter AssetWorks

•Advanced technology

- Internet
- Mobile
- Interactive video

UP IN THE AIR

•Vertical applications

- Basestar (Manufacturing)
- HealthView (Health care)

•Word processing

- DECwrite for Sux
- WPS-Plus for DOS
- WPS-Plus for OpenVMS

•Other

- Polycenter SHMP Manager 300
- DECvult

Surprise alliance looks bright for Mac Pac users

PeopleSoft takes manufacturing lead

By Rosemary Caffano

Anderson Consulting recently gave its manufacturing software customers a very clear picture of where the Mac Pac product line is headed. Instead of providing its own client/server follow-on, Anderson will offer the recently announced PeopleSoft Corp. manufacturing software.

It sounds like a good plan. The only hitch is that it sends many users to an unexpected destination.

So last week customers were still evaluating Anderson's new direction. Chicago-based Anderson has about 1,000 Mac Pac users.

Better off

"My concern is that this will deliver better functionality than Mac Pac," said Jeff Harvey, vice president of information technology at Sandberg & Sikorski

in New York. "Provided that's done and there's a clean and easy migration path, then we are all for it."

Harvey and other users said the good news was that Anderson would finally deliver a set of client/server manufacturing modules. The potential downside could be difficulty in migrating to the PeopleSoft software, says an Anderson spokesman.

But Carleton Kilmer, managing partner of industrial prod-

ucts at Anderson, said the company will provide migration aids and assistance to the PeopleSoft platform.

PeopleSoft is scheduled to ship its software next year (see story below).

"The picture I am trying to point is we will work with clients into the future; this isn't abrupt," Kilmer said.

The plan is to enhance Mac Pae, which runs on the IBM AS/400, for at least two more years and support it for at least four years, Kilmer added.

Fourth down

Industry analysts said the Anderson plan could be beneficial to users because it will help their software provider focus on its core strengths—consulting and implementation.

"The [Mac Pac] software had been doing OK, but it was not taking the market by storm," said Erik Keller, an analyst at Gartner Group, Inc. in Stamford, Conn. "They had to get in the next generation, [and] there was a lot of investment on foot to get there. They didn't have the size and resources to dedicate to that, so they decided to punt."

Targets for PeopleSoft

1994 manufacturing enterprise resource planning software revenue*

SAP AG	\$733M
Computer Associates International	\$450M
System Software Associates	\$357M
J. D. Edwards	\$320M
Baan International	\$250M
Oracle	\$153M
Anderson Consulting	\$103M
Marzan	\$100M
American Software	\$94M

*Sales to manufacturing companies only.

Sources: Research Management Consulting, Boston.

Chuck Hudson, IS manager at Klockner Pentaplast of America, Inc. in Gordonsville, Va., said he was uncertain which direction he will take once his company outgrows the current Mac Pae. He also said he feels fortunate that he will not have to make this decision any time soon because he is not sure what the best move will be.

Pat Curley, corporate director of information services at MedSense, Inc. in Waltham, Mass., is a longtime Mac Pae user who considers the Mac Pae shift a smart long-term move by Anderson.

"God knows, don't want us wait two more years to find out [Mac Pae] won't match the competition," Curley said. "I think it's a bold move for Anderson to say, 'Hey, we really feel we can offer expertise in a different way. We are going back to our core competencies.'"

PeopleSoft's new frontier

PeopleSoft officially made its long-expected entry into the client/server manufacturing market earlier this month, launching a strategy that would deliver manufacturing applications beginning next year.

The Pleasanton, Calif., company took the unusual step of setting up a separate corporate entity called PeopleSoft Manufacturing, Inc., in conjunction with Northwest Venture Capital to handle the manufacturing software development. The idea is to run a more focused operation that will not put a drain on corporate resources.

PeopleSoft currently sells client/server human resources, financial and distribution software.

Users said they were pleased with PeopleSoft's plans, and at least one customer said he is hopeful that he will get his hands on early code before year's end.

"We have seen working code," said Steven Horvitz, director of field systems at Entex Information Services, Inc. in Rye Brook, N.Y. "We were impressed with the amount of base-level functionality they will provide with the system."

—Rosemary Caffano

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Digital

CONTINUED FROM PAGE 63

Digital's decision to focus on areas such as middleware and groupware is "a good direction for them to go in," said Tom McIntyre, Digital Equipment Computer Users Society (DECUS) vice president and a senior industry analyst at Reichmuth Partners, Inc. in Cambridge, Mass.

He said middleware can become "a major growth opportunity" because most independent software vendors are conceding that space to platform vendors such as Digital. "The niche is not completely owned by anybody else," McIntyre said.

McIntyre said Digital's current change in direction away from vertical applications is actually a return to its original philosophy of leaving end-user software development to somebody else.

He added that even in those few target areas, Digital still has plenty of software development work ahead for itself. He said the company needs to better integrate its middleware tools so they work from the enterprise to the desktop levels. Dan Light, manager of systems pro-

gramming at Bissell, Inc. in Grand Rapids, Mich., said he is having trouble getting Digital's Pathworks network operating system to work with the laptops that employees are taking home. "There seem to be more problems than you would hope for," Light said. "Digital can't even get that working for us."

According to Sirecreek, Digital is currently doing a case-by-case review of its software portfolio but is not prepared to announce the fate of specific applications.

She emphasized that Digital is committed to providing users with a soft landing, and said the company will continue to make the most popular products and will make sure others are supported by a third party if an application is headed for retirement. Digital will give users plenty of notice, she added.

At the recent DECUS conference in Washington, users said they would rather know the fate of their applications—even if Digital is putting programs out to pasture—than live with uncertainty.

Shannon added that after the August 1994 announcement of Digital's sale of the Rdb database to Oracle Corp. in December, the company is "painfully aware that the last thing they can afford to do is alienate and lose customers."

Large Systems

Prism Solutions, Inc. has introduced **Prism Directory Manager**, a client/server suite for holding centralized directories of meta data.

According to the Sunnyvale, Calif., company, **Prism Directory Manager** builds an integrated view of warehouse information expressed in business and technical terms. It helps users understand what data is in the warehouse, where it came from and how it was transformed over time.

Prism Directory Manager has three components: **Directory Builder**, which gathers meta data from various sources; **Information Directory**, which stores integrated meta data as objects on a relational database; and **Directory Navigator**, which provides analysis with navigation tools through the meta data stored in the **Information Directory**.

Prism Directory Manager is available for Sybase, Inc. server databases. Support for Oracle Corp., Informix Corp. and others is planned for later this year.

Prism Directory Manager costs \$35,000 and includes one **Directory Builder** seat and five **Directory Navigator** seats. Additional seats cost \$500 each.

► **Prism Solutions**
(408) 451-0240

Peregrine Systems, Inc. has announced the **Fastload** family of database products, which support IBM's DB2 for OS/2 and DB2 AIX.

According to the Carlsbad, Calif., company, the product extracts DB2 data and packages it in either DB2 for OS/2 or AIX formats. Once the data is formatted, the package can be inserted on the target DB2 server. **Fastload's** proprietary packaging procedure can be executed on either the mainframe or the server.

Fastload also supports copying data in DB2 for Hewlett-Packard Co.'s HP-UX. Pricing starts at \$1,200 for a single server.

► **Peregrine Systems**
(619) 431-2400

Computerware Corp. has announced **EcoTools 3.0**, integrated systems management software for production database applications running on Unix.

According to the Farmington Hills, Mich., company, **EcoTools 3.0** provides distributed systems management functionality to companies running production client/server applications from Oracle Corp. and Sybase, Inc.

EcoTools 3.0 was designed with an increased depth of functionality for managing relational database management systems and Unix environments. It also has simplified production capabilities and expanded monitoring and analysis features. **EcoTools 3.0** is currently available for Sun Microsystems, Inc.'s Solaris. Pricing for **EcoTools 3.0** starts at \$25,000.

► **Computerware**
(810) 737-7300

Legent Corp. has announced **LDM/XP 1.2**, a suite of cross-platform database migration products.

According to the Herndon, Va., company, **LDM/XP** is a production-oriented product designed to move host-based data in server-based systems. The suite consists of **LD-Extraction**, **LD-Conversion** and **LD-Transport**.

LD-Extraction pulls specified data from IBM's DB2 and MVS Sequential and Software AG of North America, Inc.'s

Adabas sources, according to Legent.

LD-Conversion takes the extracted data and converts it on the MVS mainframe into a required format. **LD-Transport** delivers high-speed, high-volume, unattended file transfers between an MVS source and workstations, servers and LAN environments.

Pricing for the **LDM/XP 1.2** suite starts at \$4,000.

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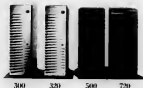
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Manager, End-User Computing
Alamo Community College District
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Application Development

Object request brokers get second wind

New products, new features on tap

By Elizabeth Heicher

Users will this year be able to work with the second generation of object request brokers, a critical element in distributed object systems. Products implementing features found in the second version of the Object Management Group's Common Object Request Broker Architecture (CORBA) standard (see story at right) will begin shipping to customers this year. Dublin-based Iona Technologies Ltd. is the first to disclose its schedule and product plans.

Bign Smalltalk

Corporate users implementing object request broker technology in distributed object systems said they are interested in the new mapping between the CORBA Interface Definition Language and popular object-oriented programming languages such as C++ and Smalltalk. Smalltalk in particular is gaining popularity among corporate application developers. Many consider it easier to use, with a shorter learning curve for Cobol developers, according to observers.

"Right now, our main development is in C++, but there's a lot of development at the OGL level going on with Smalltalk," said John Strand, director of technology planning and integration at Sprint Corp. in Overland Park, Kansas. "One of the things I didn't want to do was to divorce ourselves from opportunities in the Smalltalk domain."

Sprint is using Exports Corp.'s Xebell object request broker for a network and service management system that Strand hopes to deploy in December. Strand has requested that San Diego-based Exports

Object request brokers (ORB)

reside on a network and mediate interactions among objects in a distributed, object-oriented software application. Vendors working together in the Object Management Group have defined Version 2.0 of the object request broker standard, CORBA, which includes an interoperability protocol so vendors' object request brokers can easily talk to one another.

soft build an interface in Smalltalk.

Iona's "irbucle" for implementing CORBA 2.0 functionality calls for it to deliver C++ mapping and support for the object request broker interoperability protocol in the third quarter, according to the company. Ada language mapping is due in the fourth quarter, followed by support for an interface repository and Smalltalk mapping in the first quarter of 1996.

Digital Equipment Corp.'s object request broker, ObjectBroker, is also moving toward CORBA 2.0 compliance, but the company has not yet set firm dates for software releases, said Robert Mauro, marketing manager for ObjectBroker. However, an announcement is expected soon, he added.

An Exports spokesman said CORBA 2.0 compliance is planned but did not say when it would be delivered.

The CORBA/OLE challenge



Microsoft Corp. has made it crystal clear that it hopes to challenge CORBA object request brokers with a Redmond, Wash.-invented technology for managing interaction among objects on a network. The company took its stand earlier this month by saying it is defining a specification for the technology called the OLE Component Coordinator.

But OLE Component Coordinator is still on the drawing board, and CORBA-compliant products are now implementing the second generation of the Object Management Group (OMG) standard. Thus, users on the leading edge of distributed object implementations see CORBA forming the object backbone in heterogeneous environments, with Microsoft's OLE being integrated where needed.

"We're not preventing OLE from being used, but we believe that, fundamentally, CORBA will be the underlying standard," said John Strand, director of technology planning and integration at Sprint.

However, most members of the CORBA camp recognize the need to play nicely with OLE as a result of Microsoft's desktop dominance and are working to ensure that they can do so. OMG recently issued a request for technology that will provide the basis for a standard for OLE/CORBA interoperability.

And both Digital and Iona Technologies already offer ways to call remote CORBA objects from OLE-enabled desktop applications.

At Solomon Brothers, Inc. investment bank in New York, Liawitay Chang, vice president of advanced technologies and as Iona Orbis user, has found OLE interoperability with CORBA gives him "the best of both worlds."

"There are two camps emerging in the object world—Microsoft OLE and CORBA. But it's very important for us that the two are linked together," Chang said.

—Elizabeth Heicher

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Utility program lures users to savings

By Thomas Hoffman
SEATTLE, W.A.

When Public Service Electric & Gas Co. (PSE&G) began promoting an energy conservation plan in the spring of 1993, executives at the utility used the most provocative means of attracting its 250,000 industrial customers to the program—it dangled big-dollar savings in front of them.

To put those savings at their fingertips, the \$5.9 billion utility created a set of DOS-based disks that customers could use to calculate their monthly savings through various types of energy conservation programs.

"We felt that if we established and published energy prices to customers—projected over a 10- to 15-year period—it would open up the [demand-side management] program to even more customers," said Richard Hoernlein, a product manager at PSE&G, which has signed up nearly 1,000 of its largest customers so far, including Merck & Co.

Self-help

Under the conservation program known as The Standard Offer, the utility sought to provide its commercial customers with a simple way to seek approval for their retrofitted lighting systems from PSE&G. Customers would also require some means to calculate their kilowatt savings during peak

ON SITE

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Challenge: To lure its industrial customers to an energy conservation program through simplified conversion techniques and attractive cost savings.

Technology: Borland's Paradox for DOS and Paradox for Windows database management systems.

Results: Company has signed up nearly 1,000 customers to its 15-year energy contracts before competition opens up and has reduced its summer peak energy demand by 60 megawatts. It has saved the company \$50 million to \$60 million in plant construction.

and nonpeak periods.

Furthermore, PSE&G, which powers two-thirds of the Garden State, needed systems robust enough to audit and track its customers' highly complex lighting redesign projects.

In 1993, PSE&G hired Parpoint Systems Corp., a Hoboken, N.J.-based consultancy that specializes in database and client/server application development, to build the customer disks and a PSE&G auditing system. Parpoint used Borland International, Inc.'s Paradox for DOS database management system to create the menu-driven customer programs, called AESOP, or Automated Entry/Standard Offer Proposal, according to Joseph C. Pang, president of Parpoint.

The consultancy also developed a Windows-based tracking system using Borland's Paradox for Windows software.

PSE&G's AESOP program, which energy experts describe as leading-edge, is a step-by-step system that offers customers various energy conservation programs, estimates on their kilowatt/hour payments and anticipated monthly savings from the utility.

While PSE&G's software-driven program has been in place for more than two years, other utilities, such as those in New Orleans and Denver, have only recently begun their own automated pilot programs, said Matt Chwalowski,

PSE&G's Richard Hoernlein: "Our software investment is nothing compared to what it would have cost us to build additional power plants."

manager of electrotechnology policy at the Edison Electric Institute, an association for the electrical utility industry in Washington. "What PSE&G is doing with technology is probably on the cutting edge," Chwalowski added.

Its customers seem to think so. ITT Avionics, a Clifton, N.J., defense electronics maker that began participating in PSE&G's Standard Offer lighting program in April 1994, is saving \$40,000 annually from a \$313,000 retrofit of one of its lighting systems. Another \$47,000 in annual paybacks from PSE&G will help the maker of radar jamming equipment recoup its initial investment in the first 2.3 years of its 10-year agreement

with the utility, said Phil Cacossa, a senior facilities manager at ITT Avionics.

Although Cacossa and other PSE&G customers have been satisfied with the DOS-based proposal software, the utility's auditors said they look forward to PSE&G's planned upgrade of the tracking system to run on the company's Oracle Corp. marketing database.

The performance of the current system, which runs on six Compaq Computer Corp. 486-based workstations over a Banyan Systems, Inc. Vines LAN, has been slowed by heavy network traffic, according to Joseph F. Pratik, a project engineer at A&C Enercom, a Newark-based auditing firm.

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OBJECT WORLD

Objects In Action 1995

Computer Associates' Sam Greenblatt talks about the role of objects in business.

Recently, we met with Sam Greenblatt, Vice President of Research and Development at Computer Associates, the \$3 billion software giant. Mr. Greenblatt is also a member of the Object Management Group's (OMG) Board of Directors and a judge for Computerworld's Object Application Awards program. Here he talks about the role of objects in supporting business objectives. And the value of attending Object World San Francisco.

So when did you first start using objects?

"I've been interested in object technology for many years, but my first real business application involving OT was in 1989 when I was at Candle Corporation. We turned to OT because it was really the only technology that could handle the complexity of the business problems we were trying to solve at that time. Since then, I've become a believer in the power of objects."

How are you putting objects to work at Computer Associates?

"As you know, today's business users have boundless access to information across networks and services... they're no longer constrained by platform. Our job is to support this new business paradigm. Here at Computer Associates, the technology of choice for developing robust business solutions in this open, distributed environment is object technology. We're leveraging OT across all our product lines to achieve rapid deployment of client/server applications. We've developed the CA-Uniscient not only to manage this transformation but to enable it as well."

How did Computer Associates develop applications prior to this?

"Well, like a lot of other companies in the past decade, we were confined by limited network bandwidth, expensive hardware and restricted resources in development tools. But Computer Associates recognized that it needed to move to a unified development environment making data, communications and computing resources. That's why we developed CA-90. The company recognized that by moving to CA-90 it could leverage its legacy systems, protect its database investment, and provide multipatform portability and integration. Now object technology just extends it that much further."

How does Object Technology fit into the picture?

"First of all, the specifications for unified development at Computer Associates call for object technology. We use OT to design and implement our products, giving us an extensible foundation. Object modeling and design

provide a simpler transition from design to implementation. What's more, Computer Associates has a blueprint we're sharing with our client base. Through a concept we call *isomorphic services*, we can provide portability and system management—application services common to all our applications."

Can you give us some specific results?

"While other companies were struggling to get applications like CA-Uniscient up and running, we were able to deploy it across multiple platforms at blinding speed. Not only did we transcend traditional porting time, we used a common platform to enable our clients to deploy mission-critical applications from a management viewpoint."

What's the most important advice you can give to Object World attendees about to implement object-oriented applications?

"There are several basic guidelines that are critical to successfully deploying objects and building distributed applications. But perhaps my most useful suggestion is this: when adopting object technology, proceed with due diligence to ensure that the value of the technology matches the expense of the business investment you're making. I can't overemphasize the importance of linking OT to an organization's business objectives."

Why is Object World San Francisco the best forum for learning about objects?

"Because Object World is the central gathering place for everyone who's anyone in the world of objects. Attendees get the opportunity to hear directly from companies like theirs who are using OT to solve real-world business problems. And they'll gain a common understanding of object development in a multivendor, heterogeneous environment...one where they have the tools to move to the next generation of enterprise computing. In fact, everybody who comes to Object World San Francisco—developers and users alike—will be able to clearly focus on the business impact of OT."



Don't miss Sam Greenblatt and other OT movers and shakers at Object World San Francisco.

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UPDATE
No. 8

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Power Macintosh

Apple gives developers a peek at the future

Cyberdog Web browser also previewed

By Lisa Pirralle

"If you build it, they will come."

That memorable line from the movie *Field of Dreams* can also be heard at Apple Computer, Inc. But the Cupertino, Calif., computer maker is making sure that its third-party developers have the know-how and the tools necessary to build "it."

The big "it" for Apple is the future Macintosh platform, which uses OpenDoc, a component document architecture, and the PowerPC-based Power Macintosh as its foundation.

At Apple's recent Worldwide Developer Conference, an annual gathering of more than 3,500 commercial and corporate Macintosh developers, Apple and a handful of other vendors announced a host of OpenDoc and Power Macintosh related tools and technology alliances. The announcements are part of an effort to lay the groundwork for the success of the Macintosh platform.

Aiming to provide developers with a more robust environment for creating Macintosh applications, Symantec Corp., Language Systems Corp. and Metrowerks, Inc. signed deals

with Apple to license MacApp and the OpenDoc Development Framework.

MacApp is Apple's application framework for creating Macintosh applications. The OpenDoc Development Framework provides the building blocks for developing cross-platform applications. Under the terms of the deals, these frameworks will be integrated into each developer's respective development environments.



New and improved

Apple also announced updates to a trio of Macintosh programming tools and technologies. The company is now shipping Release 17 of the Macintosh Programmer's Workshop (MPW).

Pro, a C/C++ programming environment for developing Power Macintosh applications; Release 17 of ETO: Essentials Tools Objects, a development tool that includes MPW Pro Release 17 and Symantec's C++ 8.0 for the Power Macintosh; and Release 3.0 of the Mac OS software developer's kit, a collection of technologies and programming information

HIGHLIGHTS OF APPLE'S WORLDWIDE DEVELOPERS CONFERENCE

AGREEMENTS

- Symantec, Language Systems and Metrowerks licensed Apple's MacApp and OpenDoc Development Framework
- Apple and Visigenic Software will provide ODBC 2.1 APIs to Macintosh developers

TECHNOLOGY DEALS PEERS

- Cyberdog — Apple's on-line browser and navigation tool that can access the Internet from within desktop applications
- Copland — The next-generation Mac OS
- AppWare — Novell's OpenDoc version of its graphical applications builder
- CommonPoint — Taligent's object-oriented development framework, running on Copland

ANNOUNCEMENTS

- Apple is shipping Release 17 of the Macintosh Programmer's Workshop - Pro, Release 17 of ETO: Essentials Tools Objects and Release 3.0 of the Mac OS software developer's kit

for supporting system extensions to the Mac OS.

In response to users' demands for better client/server access, Apple signed an agreement whereby Visigenic Software, Inc. will provide Open Database Connectivity (ODBC) 2.1 application programming interfaces to Macintosh developers. ODBC was introduced in 1992 as a way for Windows developers to provide transparent access to local and server-

based data sources from client/server systems.

In addition to developer tools, Apple used its annual conference to give attendees a sneak peek at future technologies and products.

Apple showed off Cyberdog, an OpenDoc-based tool for navigating and browsing the World-Wide Web. Cyberdog, however, goes beyond the capabilities of current Web browsers by enabling users to create direct links to specific Web pages from within applications. Once links are established, information in documents can be automatically updated. Cyberdog is likely to appear as a feature in an interim release of the Mac OS.

Customized Copland

Apple also offered a glimpse of Copland, the next generation of the Mac OS due out in mid-1996 (CW, May 15). Copland offers a revamped method for handling large files and information, the ability to completely customize its interface not only for look and feel but also for the appropriate skill level of the users. Copland is expected to include enhanced electronic-mail features using Apple's PowerTalk technology.

And demonstrating its commitment to the Macintosh, Taligent, Inc. previewed a version of CommonPoint, its object-oriented development framework, running on the Copland operating system.

"Apple is finally paying attention to its developers," said Chris LeToc, president of SoftTracks, a market researcher in Los Altos, Calif.

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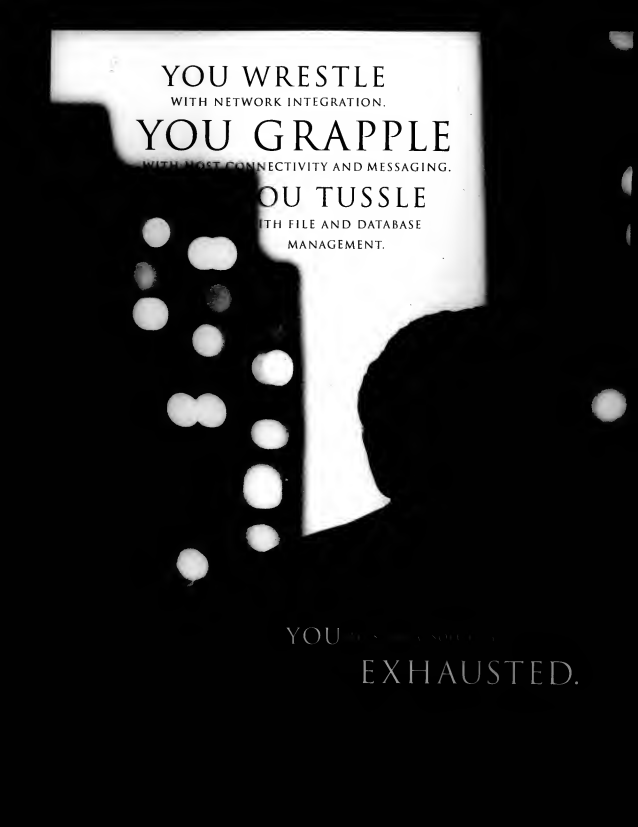
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Application Development

Thomson Software Products has introduced TeleUse/DB 2.0, a development tool that builds graphical user interfaces (GUI) based on the Open Software Foundation's Motif interface for relational database applications.

According to the San Diego company, TeleUse/DB 2.0 lets developers rapidly specify the layout and behavior of a simple GUI that can perform most database operations. Its set of database object access routines allows reference and reuse of objects in Sybase, Inc. and Oracle Corp. databases and obtains information associated with their columns.

TeleUse/DB 2.0 features a database browser tool, a database template builder, open systems development facilities, automatic code generation and application testing facilities.

TeleUse/DB 2.0 costs \$0,000

► Thomson Software Products
(619) 457-2700

ParPlace Systems, Inc. has introduced VisualWorks 2.0 for the Power Macintosh, a client/server application development tool.

According to the Sunnyvale, Calif. company, VisualWorks 2.0 for the Power Macintosh lets developers build and deploy workgroup, departmental and enterprise-wide applications. It includes a database application creator for rapid development, a graphical user interface builder and ParPlace Suntalk object-oriented programming language.

Applications written in VisualWorks 2.0 for the Power Macintosh are instantly portable across client/server platforms, including Microsoft Corp.'s Windows and Windows NT, OS/2 and most Unix-based systems.

VisualWorks 2.0 for the Power Macintosh costs \$2,995.

► ParPlace Systems
(408) 451-9090

AutoTester, Inc. has released AutoTester 3.0 for Windows and AutoTester 3.0 for OS/2, testing and verification tools for graphical user interface testing.

According to the Dallas company, AutoTester 3.0 stores test results in a database and lets users view the results on-line immediately after testing. The testing viewer can be configured for specific levels of detail. It includes a bit-map comparison facility to view differences between expected and actual images.

AutoTester 3.0 analyzes test results in several report formats, including Test Log, Error Log and Test Response Log. Pricing for AutoTester 3.0 for Windows starts at \$2,800 per copy. Pricing for AutoTester for OS/2 begins at \$5,000 per user copy.

► AutoTester
(214) 358-1196

IBM has released C Set ++ for Sun Microsystems, Inc.'s Solaris.

According to the Somers, N.Y. division, the product lets C++ programmers develop object-oriented client/server applica-

tions for a wide range of platforms.

C Set ++ for Solaris features optimizing compiler technology that helps developers deliver better runtime performance for their applications. It also has a linking mechanism for creating and using objects or reusable software components across various applications.

The product's development environment includes class libraries, an editor, a browser, a debugger and a performance analyzer.

C Set ++ for Solaris costs \$4,875 for a single-user version.

► IBM
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Raindrop Software Corp. has announced Open Mail System (OMS) 1.5, an electronic-mail development tool for Windows application developers.

According to the Richardson, Texas, company, OMS 1.5 lets Windows developers provide E-mail in an application that

complies with the mail-handling protocols: Vendor-Independent Messaging, Message Handling Service and Messaging Application Programming Interface.

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VOICES from THE EDGE

*At MIS Network
Associates, unemployed
IS managers share
leads, provide support
— and sometimes find
something to celebrate*

By Leslie Goff

"Well, I'm
obsolete now."
"Yeah, I'm a
retread, too."

A thick cloud of smoke hangs over the heads of two men as they gather around the bar; briefcases slung at their feet. In the dim room, they nod their graying heads and talk in low voices.

Beside one man's briefcase

is a neon-colored bag that proclaims "Microsoft Delivers."

It's almost 2 p.m. on a Tuesday. Approximately 60 people crowd into the room. Many of them spot familiar faces, grin at one another and vigorously shake hands. It isn't Tuesday afternoon in a tavern; it's an anteroom at the Knights of Columbus Hall in Ridgewood, N.J., and the men are gathered around the bar to share job leads, not highballs.

They meet each week to share tips on working with recruiters, training opportunities and valuable gossip on who's hiring and who's firing in their area.

But members of the MIS Network Associates say they've found something else even more valuable: emotional support from peers who have suddenly found themselves cut loose after durable careers spent climbing the information systems management ladder.

"The group is very therapeutic — it's as much for your head as for job leads," says one member, who asked not to be identified. "People are honest with each other about being nervous or depressed. No one is beating their chest over anything. Rather, there's more an attitude of don't cry to me because I'll just cry back, but let's take the bull by the horns and do what we've got to do to get these problems resolved."

In the tone of a 12-step meeting, new members — there are seven on this day — rise, introduce themselves and recount the path that led them

Voices from the edge, page 89



VOICES from THE EDGE

CONTINUED FROM PAGE 79

to this group. A business systems analyst with process re-engineering experience has fallen prey to Kmart Corp.'s well-publicized consolidation of operations in Troy, Mich. A systems analyst's group is being disbanded when Oracle Corp.'s contract with AT&T Global Information Solutions expires shortly. A project manager with 20 years of experience was hit by reengineering IBM's subsidiary, Integrated Systems Solutions Corp. A high-salaried IS executive at Perama Kyjessco Co. lost his position in a corporate downsizing.

The uncertainty of living on severance pay, unemployment checks and savings accounts after earning annual six-figure salaries is only one frustration these former IS managers face. A strong undercurrent of hope runs through the group's discussions, but members are palpably frustrated as well. The talk ranges from announcements—and critique—of upcoming training opportunities and industry conferences to news of members who "landed," to a lively debate over whether job hunters should release references before they've received an offer or at least a solid indication that they're a strong candidate. In their dilemma, they question how far they should lower their expectations, and standards, to get back to work.

NEXT DOOR TO THE TWILIGHT ZONE

"If you were running a department of 24 people and a multimillion-dollar budget, how far down the food chain are you expected to go? Where do you draw the line?"

That question, posed by one member, who asked to remain anonymous, hints at many members of the group. This former executive had been earning a six-figure salary as vice president of communications in a computer services provider when he was laid off last January.

"I'll consider a salary that's 65% of what it previously was. At the beginning I was saying I wanted 80% of where I was, and then I kept having to drive it down," the former executive says.

After a year of job interviews, consulting work, grappling with bills, training in new technologies and waiting, the 47-year-old ISer says he now finds himself feeling like he's "living next door to the Twilight Zone." He has been

PROFILE

MIS Network Associates

The MIS Network Associates is a regional support group for unemployed IS managers in the New York metropolitan area. The group formed in the fall of 1990, an outgrowth of massive layoffs that started in the area that year.

What began as a few unemployed ISers informally swapping job leads in the offices of an outplacement firm soon snowballed into a formal organization

with a large active membership. Attendance at meetings peaked in early 1992 when 100 people showed up one Tuesday afternoon. There are currently 60 active members, and nearly two members a week land jobs.

To join the group, prospective members must have earned a minimum annual salary of \$50,000 and held a managerial position. They must also share the urgency to "land," or find permanent employment. Contact: MIS Network Associates, P.O. Box 34, Ridgewood, N.J. 07431-0034, (201) 504-0900 or fax (201) 444-5235.

—Leslie Goff

offered a position as chief information officer at a start-up rental company, but the company is still trying to gain financing.

"So I'm sitting at the edge of a great opportunity to build a computer network from scratch ... but, I'm also still in the job market. I'm continuing to interview because I have to protect my wife and my daughter. Something could fall through," he says.

The former executive acknowledges that some days are better than others. "What's really hard to understand is that I've hired people, I've fired people. I can be very intellectual about the business pressures and demands that cause layoffs. But you can't appreciate this until you've gone through it yourself," he says. "It's hard on your self-confidence; it's an emotional strain."

He says he feeds off the blues by keeping a routine schedule and hangs on to his confidence by focusing on past accomplishments.

DOWN, BUT NOT OUT

"The economy has converted from swords to plowshares, and I've become an old pro at filling for unemployment."

Bob Parkus is attending his second meeting on this day. At 57, he finds himself unemployed for the third time in 2½ years thanks to downsizing in the defense industry. "I don't have a pension. If I retire now, there's no one who's going to send me a monthly check. But I'm not desperate yet," Parkus says.

Although his background is in sales, Parkus joined the group to keep in touch with the industry he's toiled in for 31 years and "because you never know where the right lead might come from." He leaves the meeting with a stack of photocopied job leads supplied by other members

SATISFACTION AT LAST

"The first time around I was looking for a No. 1 position. I found a No. 2 position, took it, got promoted, then got laid off again."

Despite that, John Sampson, one of the group's early members, who recently rotated through a second time, just announced to the group that he landed a job as an operations manager at AT&T Consumer Communications Products through a local consultancy, Traccon, Inc. It is encouraging news for group members.

"The group definitely supplies real leads, especially a lot of good networking contacts," says Sampson, who after only three months in the group garnered three simultaneous job offers. The Traccon lead came from a recruiter whom he met through a group member referral. He notes that his situation this time was quite different from his original membership in the MIS Network Associates, which began in February 1991. That membership lasted 19 months and ended when he landed a job at a mobile communications company via an ad in *The New York Times*.

"I didn't want to be No. 1 any more—it's too slippery a pole. I'm very satisfied now."

Goff is a freelance writer in New York.

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CLOSERS

The CIO/CEO gap still dogs IS.

Here are five ways that companies are closing the breach.

By Julia King

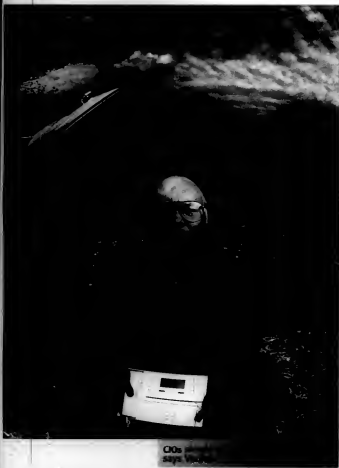
At a recent Computer Associates International, Inc. technology boot camp for chief executive officers, a Fortune 500 high school took a seat in front of a Windows-based PC. He admired the color graphics on the screen and hit the space bar a few times. Nothing happened.

Then he noticed something that looked like a plastic foot pedal. He looked around, placed it on the floor and stepped on—the mouse.

"He thought you stepped on it to make the PC go faster," recalls Charles Wang, chairman and CEO of CA, the \$2 billion software giant in Islandia, N.Y.

Are scenes like this happening across corporate America? More so than you might think. Only it's not as funny as it might look. Largely clueless about information technology, many CIOs are still unrealistic about its ability to cut costs or increase productivity. Then, when things don't turn out right, they point the finger at IS.

"One of the reasons we don't see longer tenure rates for CIOs is this unrealistic level of expectation" on the Chasm closers, page 66



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COMPUTERWORLD

Object standards accelerate

Microsoft moves emerging standard IBM puts mainstream into new development role

By David Greenstein

Microsoft Corp. has announced that it will support the Object Management Group's (OMG) Object Request Broker (ORB) standard. The announcement, made at the IBM World of Bytes conference in New York City, marks a significant step in the adoption of object-oriented technologies. Microsoft's support for the ORB standard is part of its broader strategy to promote interoperability and standardization in the software industry.

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Success strains SAP Support

All clears for telecommuting

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ENTREPRENEUR

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November 1991

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COMPUTERWORLD

Chasm closers

CONTINUED FROM PAGE 84

part of CEOs, Wang says.

For most chief information officers, this is not new information. They have heard much of it before, on the conference and seminar circuit, from re-engineering mavens and perhaps even from their own CEOs.

So why is there still such a disconnection between CEOs and CIOs? Sure, many CEOs are still technophobes, but some CIOs still don't really listen to their CEOs' concerns. Others have attempted to be more focused on their company's business or on the industry, but they haven't gone far enough.

Many CIOs remain far too narrowly focused on technological details in which the CEO has little time to get involved in a hands-on way.

"Chief information officers often get overly enamored of technology," says Kathryn Hudson, a former Kodak Corp. CIO and now CEO at W. H. Brady Co., a manufacturer of specialty labels and signs in Milwaukee.

"CIOs need to better relate to the mission of their company rather than

kaboodles behind closed boardroom doors. CIOs must become co-creators of those strategies," says Verifone, Inc. CIO Will Pape.

If the CEO got hit by a truck tomorrow, the CIO should be in theory be able to step in, according to Pape, who in addition to serving as CEO of Verifone — whose so-called virtual operating structure often places him several hundred miles from the nearest Verifone employee or CEO — also serves as general manager of Verifone's Smart Phone division.

Form alliances and campaigns

Industry experts disagree about whom CIOs should report to within their companies. On one side are those executives who say the CIO should report directly to the top executive or at least sit on an executive management council with the CEO. Others, including Hudson and Albie Collins, CIO of Home Box Office, Inc.

consist of people who can't."

At Kodak, Hudson enlisted managers in research and development to help educate senior executives on the value information technology brings to the business.

"IAD made us natural allies," she says, "because they face some of the same problems trying to make sure the CEO knows enough about electri-

FOR BOTH:

Walk in the other's shoes

The bottom line, according to both CEOs and CIOs, is that the disconnection problem won't just go away with time or by changing CIOs or CEOs. Both must actively educate themselves about each other's business, roles and priorities if their business

"Chief information officers often get overly enamored of technology."

Kathryn Hudson, former Kodak Corp. CIO and, current CEO, W. H. Brady Co., Milwaukee

cal engineering, chemical engineering, advanced lasers or whatever."

FOR THE CEO:

Sponsor 'Adopt A Techie' programs

CEOs should institutionalize opportunities for business executives to learn about IS on an ongoing basis.

Under a program Hudson and her counterpart in Kodak's R&D department nicknamed "Adopt A Techie," 30 staffers from IS and R&D were paired with 30 middle managers who traded technical and business information on an informal basis.

Rotate the CIO through the organization

CEOs should help CIOs get to know virtually every part of the business. Since joining Verifone in 1993, Pape rotated through every function in the company before becoming CIO. Today, he continues to visit various locations regularly even though he operates out of his home in Santa Fe, N.M., and the company is in Redwood City, Calif. The moves keep him current and help keep him in close touch with end-user issues.

"The way not to be a technowienie is to be involved in other parts of the business, so you're seen as a well-rounded executive and not just an IS executive," Pape says.

"CIOs need to be at trade shows relevant to their business' industry and making sales calls with salespeople," says Pape, who does both. "They need to be at development centers to understand the problems of R&D groups and to be at the major warehouses when the quarter closes. They need to have their finger on the pulse."

to get the most from the information technology in which it invests.

Bruce Simpson, CEO of Roberts Express, Inc., an Akron, Ohio, transport company that specializes in superfast deliveries of emergency shipments, is living proof.

"Now I can create some of my own spreadsheets, and I do much better with the networking available to me," says Roberts, who attended one of CA's technology boot camps, which are held four times a year to help educate CEOs about IS.

"Before, I frankly never took a laptop with me [when traveling]. I'd pore over all the paperwork on the plane," he recalls.

"Now, I download data before I leave and do the work on a laptop. I'm also trying to figure out how I can get a much more effective executive information system that is more real time than the one I have," Roberts says.

During the three-day camp sessions, groups of three CEOs are each assigned a technology advisor who shows the executives how to use basic word processing, spreadsheet and electronic-mail software.

"When they first come in, most of them are pretty clueless," Wang says of the more than 300 CEOs who have attended the camps since the first one was held in the spring of 1985.

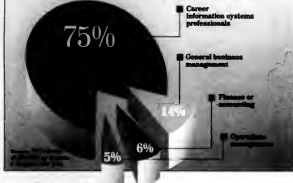
But at the end of the three days, "they are fascinated by what a PC can do," says Wang, who has also written a book titled *Techno Vision: The Executive's Survival Guide to Understanding and Managing Information Technology*.

"One of the first things I always hear from CEOs is how they are going to go back and see where the CIO reports. One of the greatest things that comes out of these technology retreats is that CEOs have a greater appreciation of technology and what it should do," Wang says.

King is Computerworld's senior editor, mid-Atlantic bureau.

Learning the trade?

Most CIOs still come from IS. For many IS leaders, it's tougher to master business issues than technology.



focus on their particular mastery of technology," says fellow CEO Jose Collazo at Infonet Services Corp. in El Segundo, Calif.

The following are steps that CEOs and CIOs can take to reduce the gap:

FOR THE CIO:

Think like an understudy to the CEO

Rather than function as enablers of a business strategy devised by the big

in New York, say the reporting structure may no longer be critical.

CIOs should concentrate less on how they fit in with those higher up in the hierarchy and focus more on making allies.

"It doesn't matter where you report if you've got enlightened management. And if you don't, you literally have to construct a campaign," Hudson says. Moreover, if you can't get senior management's attention on your own, the next best thing is to build a



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Executive

Track

The MCA/Universal Information Services Group in Universal City, Calif., has announced several promotions and appointments at the motion picture and television production company.

Rubén Bly has been appointed vice

president of corporate, studio and production support systems. He will oversee the studio systems and production support groups as well as continue to manage corporate systems, the shared software group and the MCA development and merchandising divisions' system support. Bly was formerly director



of corporate systems.

Ken Lee has been promoted to director of network services. He will be responsible for expanding MCA/Universal's LAN environment and its integration with the company's wide-area networks.

Carol O'Meara has been named director of Universal Studios Hollywood systems where she will be responsible for information systems development, management and support standards.

She will also oversee the analysis, design and implementation of new systems for the studio's business systems, including purchase management systems and the merchandise point-of-sale system. She was formerly associate director of shared software.

Jerry Pettit has been appointed director of the production support group. He will be responsible for implementing and supporting location accounting systems in the television and motion picture divisions. He will also assume responsibility for motion picture physical production systems support. Pettit was formerly associate director.

Norwest Corp. in Minneapolis has announced the appointment of **Webb Edwards** as executive vice president and chief technology officer of its technical services division. Edwards was previously executive vice president and general manager of IS at First Interstate Bancorp in Los Angeles.

Associated Travel International, a Santa Ana, Calif., provider of travel services and management for large companies, has announced the appointment of **Walter L. Williams** as chief information officer. Williams' responsibilities are expected



to grow as the company re-engineers current business processes. Prior to his appointment, Williams was vice president of technology and information services. He previously held IS positions at AST Research, Inc. and Hughes Aircraft Co. in Los Angeles.

The National Association of State Information Resource Executives in Lexington, Ky., has announced several appointments. **Gary Swindon** has been appointed director of Michigan's office of computing and telecommunications. The office will run the state's new consolidated data center, which will open this summer. **Jay Nash** has been appointed acting director of Arizona's information services division. He replaces **Ben Prochibko** who retired. **Mark Rader** has been appointed director of Alaska's department of information services. He replaces **John Valensi** who retired.

Tenex Consulting, a Burlington, Mass., management consulting firm that specializes in business improvement and information technology services, has announced that **Lelland E. Allen** has joined the company as a director. Prior to her appointment, Allen



was senior vice president of information technology at PNC Mortgage in Vernon Hills, Ill. She has also held positions at Ann Corp., Amdahl Corp., Knowledge Consortium, Bode & Balbager's Institute for Information Management and Visa U.S.A.

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Calendar

JUNE 4-10

Electronic Money: Designing, Developing and Implementing New Digital Payment Strategies. New York, June 5-6 — Topics will include: Preparing for the advent of the smart card revolution, successful card applications in the retail

sector, reaping the benefits of electronic purse applications and equipping yourself for global digital commerce. Contact: World Congress, Inc., Burlington, Mass. (617) 270-0299.

Architects/Engineers/Contractors (A/E/C) Systems '95. Atlanta, June 5-6 — Exhibit focuses on

the technological needs and interests of architects and designers, contractors and construction managers, mechanical/electrical/structural engineers, geographic information systems and mapping professionals, civil engineers and surveyors, process and power engineers and facilities managers and owners. Contact: Skanska Price, A/E/C Systems '95, Newington, Conn. (203) 965-0153.

IT Technology Association's (MTA) 48th Annual Meeting and Exposition. Chicago, June 5-9 —

Topics include object-oriented software engineering, resourcing technology, event-driven programming for graphical user interfaces, embedded SQL, and 3D Visual M programming and M window programming in a kernel environment. Contact: MTA of North America, Silver Spring, Md. (301) 451-4070.

Worldwide Personal Communications: Transforming the Vision Into Reality. Chicago, June 6-7 — Dual conference. The theme for June 6-7 is "Transforming the Vision Into Reality" and the theme for June 8 is "Wireless/Wireless Integration." Contact: ComPlan, Chicago, Ill. (312) 335-3500.

Second Annual Project Leadership Conference. Chicago, June 7-8 — Focus: Methods to improve the performance, delivery and control of information systems projects. Contact: Rob Anderson, Gellera & Co., New York, N.Y. (212) 375-1078.

JUNE 11-17

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International DBA Users Group 7th Annual North American Conference: Star of the Enterprise. Orlando, Fla., June 12-15 — Seminars include "Tuning Very Large DB2 Systems," "Replication in Mixed Database Environments" and "Client/Server — What Really Works." Contact: International DB2 Users Group, Chicago, Ill. (312) 644-6810.

Third Annual North American Information Technology Outsourcing Conference. San Francisco, June 12-13 — Contact: Amy Arnet, Frost & Sullivan, Mountain View, Calif. (415) 963-9000.

NETSEC '95. New Orleans, June 12-14 — Seminars include "Telecommunications Fraud and Toll Abuse — How Costly Is It?" "How Hackers and Phishers Enter and Leave Your System," "Lanes That Are in Place to Protect You: What They Mean," "Tips on What Can Alert You to Potential PII's Fraud," and "What To Do If You Suspect Your Phone System Has Been Breached." Contact: Computer Security Institute, San Francisco, Calif. (415) 965-2823.

IT Services Week 1995: Third Annual IT Outsourcing Conference. San Francisco, June 12-15 — Theme: "Redefining the Corporation" on June 12-13 and "Eleventh Annual Third Party and Multivendor Maintenance Conference: Trends and Issues" on June 14-15. Contact: Frost & Sullivan, Santa Clara, Calif. (909) 256-1670.

Calendar announcements should be submitted at least six weeks prior to the event and include the title of the event, dates, location, theme or focus, keynote or major speakers, principal topics and a contact person, organization and phone number.

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The CW Guide to Application Development Tools

New tools promise to overcome limits of popular products

Raising the ceiling

By Norton R. Greenfield

TAKE SOME EAGER USERS WITH A problem, add a client/server rapid development tool and a few up-to-date developers, stir and wait awhile. What do you get? An instant legacy system: difficult to expand, costly to maintain and painful to explain to users why the system doesn't age well.

The immense popularity of development tools such as Microsoft Corp.'s Visual Basic and Powersoft Corp.'s PowerBuilder has made client/server systems appear easier to build than they really are. As the simple, small workgroup-oriented systems are being declared a success, these tools and teams are being tasked to build larger and more complex applications. And they're not up to it.

A rule of thumb is that these low-end client/server development tools are capable of building systems up to one "baby unit of effort": three people for three months or any other combination adding up to about nine person/months. An application needing more effort is probably too large to be done well with first-

generation client/server tools.

The problem involves more than just the number of users who will be running the system. It has to do with scale, complexity and robustness. The scale issue encompasses the size of the resulting application (the number of screens, forms, database tables, systems involved, etc.), the size of the devel-

opment effort (the number of developers, testers, platforms, operating environments, etc.) and the size of the management effort (number of versions out in the field, control of security and access, etc.).

Consider a business-critical application that has thousands of users, hundreds of forms and re-

ports, took tens of developers, accesses several database systems on diverse platforms, needs very high performance and must run constantly. Developing this is not a job for first-generation tools.

Greenfield is principal of Implematics, Inc., a development strategies consultancy in Wayland, Mass.

INSIDE THE GUIDE

► **Breakthrough:** Users bring in new tools to overcome client/server complexity. Pages 94, 95.

► **Buyer's Choice:** This chart lists the leading tools for application development on almost any platform throughout the enterprise. Page 95.

► **Shallwatter:** In *Buyers'* Satisfaction Scorecard, Microsoft's Visual Basic, Powersoft's PowerBuilder and Gupta's SQLWindows show similar strengths and weaknesses. Page 99.

► **Most portable:** In *Line*, Uniface Six really moves around, but its application logic doesn't always bend as easily as users would like. Page 100.



The tools' greatest weaknesses

- **Capta's SQLWindows 5.0**
Programmer learning time
- **Microsoft's Visual Basic 3.0**
Support for multiple environments
- **PowerSoft's PowerBuilder 4.0**
Cost of additional products to create larger-scale applications

(Based on 130 users surveyed in Buyer Satisfaction Scorecard)

By Norton Greenfield

Effective client/server application development is based on the principle of divide and conquer. Flexibility in splitting up the application logic is the key to a tool's usefulness.

Most early (also known as first-generation) client/server systems can be called two-tiered. This architecture places most of the application logic — user interface, business rules and application calculations — on the client and keeps only the database on a server.

While this scheme provides easy access to data and processing power at the user workstation, you can still have too much of a good thing. The chief problem is

Freedom from

known as "fat clients" because the requirements of the application push the client system toward larger and more expensive desktop systems. Underpowered client systems will slow application performance.

The next level of application tools provides another level of application partitioning, which can be called two-and-a-half-tiered. Modern relational databases can store pieces of code, using SQL or an extension of it, as "stored procedures" or "triggers." These stored procedures can handle application-wide rules (for example, calculation of standard quantities such as "net margin"), normalization of input that needs more than pure clauses and some cascading processing.

But this architecture is rapidly being relegated for use in only the most simple applications because of its limitations. For example, the language of stored procedures is not standard and may not be able to express a desired algorithm; stored procedures are limited to one database; and the architecture provides no support for runtime management of the application.

The highest level of application partitioning is called three-tiered. Development tools at this level allow some part of the processing to reside on client systems — usually the presentation and user interaction part — the business logic and application algorithms are placed on a server or servers, and the database potentially resides on other servers.

This architecture allows for the optimal use of server

The development problem

- **Limited development capability**
(Three people working for three months)
- **Limited number of users per application**
- **Limited scale**
(Number of screens, forms, database tables, systems, etc.)
- **Weak team development**
(Limited version control)

resources as well as full management control. It also allows for optimal design so that, for example, the network does not get overloaded as can often happen in two- or two-and-a-half-tiered applications.

A development tool for large-scale applications must be capable of building full three-tiered applications. Be-

No dead-end worries

By Howard Millman

Breadth of capability is one of the first items on IS checklists when it comes to selecting an enterprise development tool.

Progress Software Corp.'s Integrated Application Development Environment (ADE) and relational database met this need for John Doucette, vice president of corporate services at Bay State Gas Co. in Woburn, Mass.

"We're not a big development shop, and we wanted a complete tool set that would work across an enterprise," he says.

He opted for an integrated solution using ADE and Progress's Version 7 database. "We preferred to have the database and design tools come from the same vendor so we did not have to worry about playing the middleman," Doucette says.

Bay State Gas produces up to 15,000 bills per night. In a comparative test running Progress' database on Hewlett-Packard Cx Series 9000 servers, the firm produced the bills in half the time it took on a Unisys Corp. mainframe.

"No doubt part of the improvement resulted from redoing the applications," Doucette says. "Since

the Unisys applications were built in pieces over two decades, we had a lot of redundancy. This gave us the chance to clean up that data. We have nearly 25 years of mainframe data to re-engineer over the next year."

Changing needs also motivated Michael Cullen, director of Tele-Direct in Montreal, which adopted IBM's VisualAge. The company uses a mainframe to track 240 Yellow Pages directories used by nearly 700,000 customers. Tele-Direct's applications will continue to run on the mainframe, but Cullen says he wants to provide easier access to the data for employees and customers.

"We recognized that our future is not in Cobol or JCL. We needed to make a fundamental change in how we run our business," he says. "We will develop and deploy client/server applications since a workstation is a better way to deliver information than a 3270 terminal."

Sometimes a developer's clients will instigate change with de-

mands for new features and functionality. Such is the experience of Angus McIntosh at Vancouver, British Columbia-based Redesign Resource Group. McIntosh says he is committed to Capra's tool, but that he has moved up from their Powerhouse fourth-generation language to their object-like Axtant Developers Workbench.



Progress Software's Progress Application Development Environment provides reusable objects, a data repository and access to multiple databases

"Axtant provides the productivity to quickly deliver [what our clients want]. We can't use a tool whose limitations dictate how to implement a solution," McIntosh says.

Millman is principal at Data Systems Services in Potomac, Md.

Easy to program

In addition to functional totality, Bill Fredricks at TFM Systems in Quarryville, Pa., insists on using tools that are easy to learn and easy to live with. A mechanical engineer, Fredricks taught himself to build client/server applications. "I started out at ground zero and spent six months learning [Rhythe Software, Inc. Omnis 7's] paradigm," he says.

Fredricks' first application, TechData, an equipment management application for a nuclear power generating station, took two years to build and refine.

Functional totality, however, encompasses more than design options. Some developers can reasonably predict the number of concurrent users the application will eventually serve and the amount of stored data it will manipulate; others have to commit to a development architecture that will scale to meet ever-changing demands. Correctly sizing a system so that future demands do not slow it down may seem like more of a job for an oracle than a tool.

Could that be why Tammy Lowe, assistant MIS director at Burlington Coat Factory Warehouse Corp. in Burlington, N.J., chose Oracle Corp.'s suite of tools? Lowe says Burlington Coat Factory is rapidly outgrowing the retailer's legacy system applications to respond to

the capacity of its legacy system applications to respond to the retailer's business procedures. "For us, the issue was to provide an easy-to-use interface for users at our finance, buying and distribution centers. We have about 750 total users and average up to 500 per day on the system and needed to select a scalable system," Lowe says. "We looked at PowerBuilder and Visual Basic, but I didn't think they were robust enough and could scale to meet the volume we needed." —Howard Millman

design limits

Next-generation solutions

- **Provide true application partitioning**
(Allow three-tiered systems)
- **Support diversity of environments**
(Variety of user interfaces, etc.)
- **Offer database independence**
- **Provide systems management**
(Applicationwide security, dynamic load balancing, ability to recover quickly, etc.)

ware of tools providing "application partitioning" if all that this implies is the ability to create stored procedures—that is, two-and-a-half-tiered systems.

The next set of issues deals with the diversity of environments found in any enterprise today. For example, another application capability that must be considered

is the kind of user interface allowed. While most client-server applications are aimed at graphical interfaces, there may be some need for character terminal users, and some development tools enable both kinds of interfaces to be generated from the same application definition.

The multipatforms issue is more important to an enterprise-level application than is a workgroup one. Potential clients and servers may be more diverse and less likely to be under control of the information systems organization. Client platforms are problematic because some development tools cannot handle all the versions of Windows. An evaluation of the potential target platform is needed before the development tool is chosen.

Similarly, the question of whether the application needs to be database-independent is important. Some tools lock you into the vendor's database, or perhaps give lip-service to access through gateways or Open Database Connectivity (ODBC). Others provide native drivers for all of the major database systems and have ODBC access for the rest.

An enterprise-level decision should consider not only the application being built, but also the need for future applications and the database systems used by the enterprise that may need to be connected to this application someday. The trade-off is that a database-independent tool may not use all of the features—or all of the latest features—of any particular database.

Where to find the tools

Advent 1.1

Cognix Corp.
Burlington, Mass.
(617) 229-6600

Developer/2000

Oracle Corp.
Redwood Shores, Calif.
(415) 506-7000

Power

Information Builders, Inc.
New York, N.Y.
(212) 736-4433

Porto

Porto Software, Inc.
Oakland, Calif.
(510) 868-3400

PP Passport 1.8.1

Acus, Inc.
Cupertino, Calif.
(408) 252-4444

RAM 6.1

JMCC, Inc.
New York, N.Y.
(212) 267-7722

Rev Eng 1.1

Informix Software, Inc.
Hawthorne, Calif.
(800) 331-1763

Studio 7

Syba Software, Inc.
Foster City, Calif.
(415) 871-0222

Program 7.3

Progress Software Corp.
Bedford, Mass.
(617) 280-4000

SHAW 6.10

SAS Institute, Inc.
Cary, N.C.
(919) 677-6000

Winshape

IBM
Research Triangle Park,
N.C.
(800) IBM-3333

Tight database links

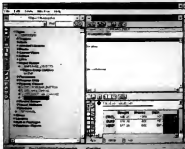
Guaranteed scalability and performance motivated Rich Burke, a systems analyst at Conesco Capital Management in Carmel, Ind., to migrate to a new application development tool. Burke uses JAMCC, Inc.'s Jam to build value-added portfolio management applications. He migrated to Jam from Microsoft Corp.'s Access and Visual Basic and Gupta Corp.'s SQLWindows. "We moved from PCs to Unix because we needed the scalability and the higher horsepower of RISC-based engines," he says.

Burke says he likes Jam's ease of use and two-tiered development cycle.

"We begin by prototyping an application and then convert the prototype into a working application. Jam's graphical environment gives us more than 300 high-level functions, which speeds development. These include books enabling programmers to write and call C functions within Jam's code," he says. "By

using Jam as a front end to Oracle Corp.'s Oracle7 database, we get the best of both worlds."

Burke says he is pleased with Oracle7, especially the database's replication feature that enables Conesco to synchronize servers located throughout the U.S.



Oracle's Developer/2000 is closely tied to the Oracle7 database, offering scalability and CASE tools.

But he acknowledges he's prepared to adopt another database if circumstances dictate. He's already identified the likely vendor.

"We may change to Informix Software, Inc.'s Informix database. We could do that because the

two database structures are similar. With Jam, we don't really have to learn multiple database languages. We plug in a different Jam driver, and we're running on Informix," he says.

While Burke committed to Jam because it offered a comprehensive solution, Jerry Hale, a systems analyst at Paramount Pictures in Hollywood, Calif., says he now uses Acus, Inc.'s 4th Passport because he trusts it. Hale, who creates proprietary applications for Paramount's Creative Affairs Department, says he prefers Passport's fourth-generation language architecture to object-oriented tools.

"I design and build client-server applications. I use Acus tools because they work. They're extensible, letting me plug C or Pascal or assembler into the application," Hale says. "In the application we're building, we have roughly 40,000 lines of code plus 10,000 lines of callable C code routines." Hale's database will ultimately serve up to 50 users and connect gateways to connect in several geographically distant LANs. —Howard Mittman

CASE can work

Jerry Hale, a systems analyst at Paramount Pictures in Hollywood, Calif., is a strong advocate of fourth-generation language architectures. "I never have a need for CASE or object orientation because the methodology doesn't fit into either the front end or the back end of the application's design," he says.

Other developers, especially those re-engineering older legacy applications, see computer-aided software engineering (CASE) as a significant time-saver. Tammy Lowe, assistant MIS director at Burlington Coat Factory Warehouse Corp., is depending on Oracle's Designer and Developer tools (formerly DCE2) as the basis for re-engineering Burlington's aging sales, marketing and inventory systems.

"These applications were developed eight years ago. Over the years, we modified and updated them, but we have so changed the way we do business that they no longer reflect our needs," Lowe explains.

As the first step in the overhaul, Lowe and her development team first identified Burlington's processes to determine the genetic makeup of the new systems. "Oracle's CASE enabled us to collect and prioritize the data we need for modeling our business practices. We used Designer/2000 for design and analysis, then continued with model-based development using Developer/2000." The front end Lowe's team developed links to an Oracle7 database running on Stratus Computer, Inc. computers.

Lowe says CASE suffers from more failures than successes. And she thinks she knows why. "Many people use CASE as a methodology to run their businesses," but they go too far.

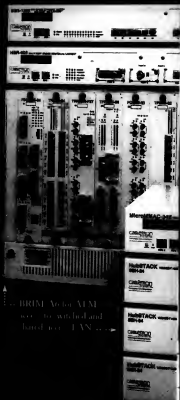
He recommends that developers scale back their sights. "Everyone wants 100% generation from their CASE code. I don't know if I'll see that in my lifetime. It's a great goal to strive for, but all of today's tools are far away from that."

"With the development tools we have available, the applications we put out this year will satisfy and amaze our users," she says. —Howard Mittman



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Top tools

Client/server development packages go in easy but run out of gas fast

By Kevin Burden

In a user evaluation of the Top 3 client/server development tools, we found their strengths and weaknesses to be more similar than different. None scored high satisfaction ratings for supporting multiple environments or developing extremely fast applications. But all tools received high ratings for operating system compatibility and ease of use.

The three products in this Scorecard currently sell only Windows versions, but Microsoft and Open Software Foundation Motif versions are reportedly on the way for PowerBuilder and SQLWindows.

Visual Basic

Those who use Microsoft Corp.'s Visual Basic 3.0 love it—or do they? True, the development tool success story of the '90s scored better than its two leading competitors in nearly every category in this Scorecard. But even Visual Basic developers realize its applications are no match for those of PowerBuilder or Gupta Corp.'s SQLWindows.

Visual Basic is a third-generation language, which means applications need to be coded from scratch. "It's great at creating small, low-end programs like database front ends. But we'd be wasting a lot of time [coding] if we used [Visual Basic] for larger applications," says Robert Chambers, a software designer at Healthgrove Group in Charleston, S.C.

Visual Basic's high score for operating system compatibility and low score for multiple environment support are not surprising for a Microsoft product. Unlike with PowerBuilder, different versions of Windows do not pose conflicts with Visual Basic, according to the users. But the tool requires Windows—Windows only. Microsoft has no plans to offer Motif or Macintosh versions.

PowerBuilder

Although PowerBuilder 4.0 from Powersoft, which was acquired by Sybase, Inc. last November, scored lower than Visual Basic in nearly every category, it is better than Visual Basic at keeping its users from jumping to high-end fourth-generation languages such as Forte Software, Inc.'s Forte or Compuware Corp.'s Uniface. PowerBuilder does not solve all the scalability problems of low-end 4GLs, but compared with Visual Basic, PowerBuilder is a

workhorse. "We've used Visual Basic, but it requires too much scripting. Besides, our applications are for as many as 200 users, and that would stretch the limits of [Visual Basic], if not break them," says Robert Mudditt, manager of systems engineering at ABE Inc. in Newtown Square, Pa.

Support for 32-bit Windows environments in the Enterprise edition of PowerBuilder 4.0 will grab the attention of those planning to move to Windows 386 or those already running Windows NT Servers.

SQLWindows

Version 3.0 is arguably the most powerful development environment of the three. But with power comes complexity, and even with the strides Gupta made in ease of use through its new QuickObjects, SQLWindows is still best suited for the professional developer.

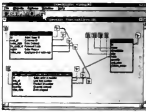
QuickObjects are reusable, prebuilt objects developers can use to build application foundations. Users said development time was faster with QuickObjects, but because they still require considerable amounts of custom programming, they did not make as great an improvement in ease of development.

SQLWindows' multiple environment support received the lowest rating of the Scorecard. But attitudes might change if Gupta makes good on a promise to deliver Macintosh and Motif versions by year's end.

Burden is Computerworld's senior researcher, Scorecard Pricing Line.



Gupta's SQLWindows 3.0 is the most powerful environment of the three but is very complex and requires a lot of custom programming.



While it didn't receive a perfect score, PowerBuilder's PowerBuilder 4.0 scored the highest for multiple environment support with its Windows, Macintosh and Motif versions.



Microsoft's Visual Basic 3.0 is great for creating small low-end programs, but many users have difficulty creating larger applications.

How they stacked up

Compatibility with operating system

Visual Basic runs without incident on all versions of Windows. PowerBuilder reportedly ran differently on Windows Versions 3.1 and 3.11.

Speed and efficiency

First-generation tools have never been known for building applications that were fast.

Value for the dollar

Loads of third-party tools and a no-frills price give Visual Basic a perceived value for the dollar attached by its competitors.

Technical support

None is in a position to brag. PowerBuilder users said the only changes they have seen since Sybase took over is options in the auto-abstract.

Support for multiple environments

All three currently offer only Windows versions. The Enterprise version of PowerBuilder is the first to support 32-bit Windows.

Average of all systems

Microsoft Corp. Visual Basic 3.0 (204) 882-0000
Powersoft Corp.'s PowerBuilder 4.0 (518) 823-3500
Gupta Corp.'s SQLWindows 3.0 (415) 321-9500

7.9 7.3 7.5

6.7 6.6 6.4

7.9 6.8 6.9

6.9 6.7 5.9

5.6 6.4 5.2

7.0 6.8 6.4

This survey was based on interviews with 50 users of each product. Users were asked to give satisfaction ratings, on a 1-to-10 scale where 10 represents maximum satisfaction, in the areas listed in the chart.

Satisfaction ratings are based on a 1-to-10 scale where 10 is best. Categories appear in order of importance as ranked by 100 users.



Uniface Six

Highly portable but lacks flexibility

By Kevin Burden

Users have not been shy in grumbling about client/server development tools. Low-end rapid development tools are "not scalable enough." With computer-aided software engineering tools, "methodologies are too rigid." And as for tools from database vendors, "we don't take well to tools telling us what database to use."

Uniface Corp. stands at each of these denunciations with Uniface Six, which builds large, scalable applications. It uses a model-driven approach—It can use any model, even one created with another tool—and does not prefer one database over another. Uniface Six comes with 19 native database management system drivers and is truly technology-independent.

Users said the product's application partitioning "was a good try" for the first version but said they hope the next version offers more flexibility in setting partitions. For now, it is best used for off-loading batch processes.

Programming environment

Uniface Six divides development into three sections: conceptual, which contains data definitions, business rules and an Application Objects Repository; external, which houses forms, reports and a Rapid Application Builder; and internal, which converts data in the Application Objects Repository into code via its database drivers.

Builder: "Since the application's logic is separate from the code and the interface, changes were made easily and without a complete makeover."

Evaluators reported success managing multiple developers through the product's version control capabilities. They said restricting access to work areas was

The Uniface Six users' Committee interviewed for this evaluation included a wholesale distributor, a retail company, a service management firm and a finance company. All using Uniface were prior to Six release.

possible but they hope the next version will be better at governing coding standards for developers.

Testing and debugging

Uniface's debugging tool was de-

Uniface Six

Compuware Corp., Ann Arbor, Calif., (510) 748-6145

Programming environment

A new graphical interface matched with new version control capabilities scored well with users.

Testing and debugging

Effectively tracks code, but there is no way to test performance.

Flexibility in logic placement

Uniface's first try at application partitioning works best on batch processes.

Report writing

Quickly puts data together for reports, but customizing their look is an arduous task, according to one user.

Interface to outside technologies

Comes complete with nearly 20 native DBMS drivers. Those scoring it low needed to write custom drivers.

Security

Has complete permission system to secure batch development environment.

Support

Very responsive, but staff has problems answering all questions due to the openness of the product.

scribed as sufficient by most evaluators. The fact that I could tie it to a separate product is a strength; the fact that I had to go to an outside product is a big weakness."

Wholesaler: "We had to turn to a third-party tool for performance testing. The fact that I could tie it to a separate product is a strength; the fact that I had to go to an outside product is a big weakness."

Logic placement flexibility

Application partitioning is possible in Uniface Six only through an extra between piece called Polyserver. Evaluators who tried to partition succeeded, though they wanted more flexibility and automation in setting partitions.

Service management firm: "We had considerable success in relocating processes off the server on to clients. This way we don't need any data transport for some of our batch processes."

Report writing

Users gave mixed reviews for reporting.

Wholesaler: "Tell it to grab data and present it in a specific context, [and] it's a real slam dunk."

Retailer: "What makes technology independent so useful is 'we can simultaneously pull down data from separate databases or switch databases in the middle of a query.'"

Rating by four users in different industries based on a 5-to-10 scale. 10 represents extremely high satisfaction and 1 represents not satisfied at all. If the evaluator felt they did not have the experience to comment, (-) replaces the score.

Wholesale distributor	Retail	Service management	Finance
7	7	9	7
5	5	7	7
3	8	9	9
8	3	10	8
10	6	-	8
8	6	9	8
3	8	8	5

in that sense."

Retailer: "The report look is not too appealing. To make it appealing is not impossible, but it's more work than we want to put into it."

Interface to outside technologies

To access data no matter what the source is Uniface's most heralded ability. The Deployment Manager in Uniface Six has 19 native DBMS drivers and offers a DBMS driver guide that documents how to custom-build additional ones.

Security

Uniface Six includes a permission system to restrict developer access to specific application areas.

Finance company: "Securing the development environment has taken away most worries about developers doing things they shouldn't, it was especially crucial for our data structure and database model itself."

Burden is Compuware Corp.'s senior researcher, Sourceware/Firing Line.

Compuware responds

Application partitioning: Uniface 6.2, slated for field-testing by year's end, will offer further partitioning abilities, letting users allocate part or all of the application processing workload to selected systems. The result will be a fully distributed, multi-tier architecture.

Reporting: Uniface Six reporting is intended for production batch reporting. Those needing a quick and easy end-user reporting tool should turn to Uniface Personal Series products.



Dirty rotten scoundrels?

In an exclusive ethics survey, *Computerworld* found that while IS professionals pay their shareware fees and worry about privacy, there's an ethical breakdown when it comes to copying commercial software

By Mitch Betts

CONTINUED FROM PAGE 1
to snooping in confidential files.

IS pros "have the skills [to abuse the systems], and that makes it more tempting," says John Glaser, vice president for IS at Brigham and Women's Hospital in Boston. "It only takes one bad apple to cause appalling damage."

Sixty-two percent of survey respondents say they should be able to download news articles from on-line services and "share them with as many people as I want," perhaps not understanding that doing so violates copyright law.

These findings contrast sharply with parts of the survey that make IS people seem like ethical saints: Most say they actually pay the registration fee for shareware and say they would not discuss information about a celebrity customer in their databases.

Ethics gurus and IS managers attribute the ethics gap to three factors: Some workers are just ignorant of the rules, such as the "fair use" doctrine for copyrighted material; some know better but find practical excuses for breaking the rules; and a few may lack a good sense of personal ethics in general.

"The IS profession is full of human beings who have their share of human problems,"

Glaser says. But the IS profession also has two unique and conflicting tensions: The skills that make abuse possible go hand in hand with IS's "additional responsibility to be supergood because they are the holders of the keys, like a sacred trust," Glaser says.

INSIDE JOB

In *Computerworld's* anonymous mail-in survey, nearly half (47%) of the respondents admit to copying commercial software without authorization — even though 76% of all respondents agree it should never be done.

"We've run across situations where the IS ethics survey, page 102

Your worst nightmare: COMPUTER FRAUD BY IS INSIDERS

Most corporate information systems professionals have little sympathy for the "hacker ethic," which holds that computer cracking is just harmless exploration. But a Computerworld IS survey found that, surprisingly, 15% of the respondents say hackers "provide a valuable service by exposing security flaws."

Furthermore, 5% say that most hackers are harmless. In a separate study by researcher Susan J. Harrington, 7% of IS professionals say if they were bank programmers, they would adjust their own checking accounts to remove a service charge for a bounced check, is that 7% significant?

"I consider it significant," says Harrington, an associate professor of IS at Georgia College in Milledgeville, Ga. "Seven percent didn't see any thing wrong with it."

These are troubling results, given that the worst security nightmare as insider fraud by IS employees—and all it takes is one or two deviants to cause a big problem. Over the years, some of the most notorious computer

or abuses have been attributed to IS professionals:

■ In 1979, Stanley Mark Rifkin, a computer consultant to Security Pacific National Bank, was convicted of transferring \$30.2 million to a Swiss bank account. Rifkin was sentenced to eight years in prison.

■ In 1986, Donald Gene Burleson, a systems analyst and computer operations manager at an insurance company, was convicted of planting a virus-like "time bomb" program that deleted more than 1,66,000 records of sales commissions at the company. The bomb was triggered two days after Burleson was fired from the company. He was sentenced to seven years' probation and ordered to pay \$11,600 in restitution.

■ At Long Island, N.Y., university, the data center manager and his assistant were found guilty of using the school's computer to provide computer services to private businesses. The fees they collected amounted to \$53,000 from one client alone.

—Miltch Bertha

audit was complete, the company did nothing about the problems it uncovered. Kruger says. In November, the company paid \$250,000 to settle the lawsuit.

If a piracy case actually goes to trial and the defendant loses, the penalties can be up to \$100,000 per copyrighted work, which can add up to millions of dollars in liability, Kruger notes.

In contrast, the survey shows that 64% say they always pay the fee for shareware that they use regularly and that IS professionals are highly sensitive to privacy.

NO FODDER FOR THE ENQUIRER

The vast majority (84%) of respondents say they would not gossip about celebrity details gleaned from their databases; 62% oppose monitoring an employee's electronic mail, and 57% are concerned that highly focused marketing campaigns based on customer databases "are

When I turned my attention to software inventory, I discovered hundreds of illegal copies— and very few licenses. I took the issue to the president of the company and was told I was hired to save money and not to cost them money. If going legal meant spending money, it wouldn't happen."

The IS manager felt guilty about presiding over a sea of copyright infringement, Kruger says. Acting on the tip, BSA's lawyers were able to persuade the company president to reach a settlement to which the company bought the proper licenses and paid a financial penalty, too.

As the hot line calls illustrate, IS professionals know that one way to net on their ethical convictions is to report abuses to internal or external parties. The Computerworld survey shows that 72% of IS professionals say they would blow the whistle if their company planned to use information systems in unethical ways.

That is, they would blow the whistle in theory. The actual deed is hard to do because society trusts whistle-blowers like schoolyard tattletales, and some whistle-blowers end up transferred, demoted or fired.

Having interviewed dozens of IS professionals for his 1994 book, *Managing Privacy*, an IS ethics survey, page 104



Copyrights and wrongs

Percentage of IS professionals who say it is acceptable to...

Copy software licensed for one machine for home or laptop use: **39%**

Copy commercial software to try it out: **27%**

Download copyrighted software from a computer bulletin board: **16%**

Source: 255 IS professionals

Source: Computerworld

IS ethics survey

CONTINUED FROM PAGE 101

department, the IS manager, is personally installing or reproducing unlicensed software. Or they are allowing more users access off a server than they have licenses to support," says Robert Kruger, director of enforcement at the Business Software Alliance (BSA) in Washington.

Software piracy in a corporate setting is "directly traceable to IS people," Kruger declares. "Either they're allowing it to happen or actively engaging in it."

The problem is of more than academic or vendor interest because the BSA is famous for sending federal marshals to raid corporate sites. The cost of criminal or civil penalties, or even of an out-of-court settlement, is at least twice the cost of "getting legal" in the first place.

Last December, the BSA and federal marshals raided the offices of Southern Benefits Consultants, Inc., an insurance administrator in Dallas, after a tip from a former IS employee. By March, the company had agreed to pay a \$110,000 settlement. "The problem was known by everybody, but they had insufficient resolve to deal with it," Kruger says.

Similarly, Ulen Enterprises, Inc., a leading auto parts maker in Shelby, Mich., was turned in by a former IS employee who had helped the company do its own software audit, when the

bang too far."

Why do IS professionals fall off the ethics wagon when it comes to software piracy? Interviews with 10 experts in computer ethics indicate that while IS workers see that privacy violations harm an identifiable person, they rationalize that making copies of PC software packages has little effect on giant vendor companies led by millions.

In essence, software piracy is in danger of hitting the ethical "jayswalking" zone, despite the industry's best efforts to proselytize and prosecute.

The perception that copying is widespread makes the problem worse, according to research by Susan J. Harrington, an expert on IS ethics at Georgia College in Milledgeville, Ga. She finds that some IS workers—especially those categorized as "other-directed," or greatly influenced by others' opinions—rely on an "everybody does it" rationale for illegal copying.

DROP A DIME

On the other hand, the BSA's best tipsters are often IS employees and former employees. Kruger says. Answered the BSA's antipiracy hot line and found the top IS executive of a large real-estate company on the other end. The story of the still-anonymous IS executive—who turned in his own company to the software police without the company ever knowing—goes something like this:

"The company hired me three months ago,

An ethics checklist for CIOs

- Can employees report project delays and problems without fear?
- Do we have licenses to cover all software used?
- Do we have enough independent auditors to root out computer abuses?
- Do we have an ethics code that is well publicized, updated and enforced?
- Is there a clear, enforced policy on data confidentiality?
- Is there a policy on monitoring employees' electronic mail?
- Is there a policy on proper use of on-line services and the Internet?
- Is our ethics code based on real situations?
- Are social/ethical implications discussed at the start of system projects?
- Do we explain the biases and limitations of our systems to users?

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IS ethics survey

CONTINUED FROM PAGE 102

their Jeff Smith says IS professionals see themselves merely as technology implementers and rarely raise the privacy issue, even when they harbor private concerns. "There are a lot of sales told by IS professionals, but not many where they blow the whistle," Smith says.

But failure to blow the whistle can put the organization at risk for legal liability or embarrassment. Consider this actual case (some details have been disguised) drawn from Smith's research:

Julie was an IS executive at a bank, where the marketing department had asked that customer data be extracted from mortgage applications. Marketing wanted to use the data, which included income and debt history, in a marketing campaign. Although several mortgage managers complained, Julie delivered the data anyway, figuring it was not her job to be a data cop. After word leaked to the press, the company's chief executive officer had to defend the potential public relations disaster and reprimanded Julie for not raising the privacy issue.

SPEAK NO EVIL IS professionals also stay mum when it comes to IS projects that have gone sour. A classic case was Confirm, AMR

Corp.'s ill-fated effort to build a huge reservation system for hotels and rental car companies. The project was canceled in mid-1992 with much finger-pointing and many lawsuits and countersuits.

A key problem was that none of the system developers gave their business partners an honest assessment of the technical problems, which meant the clients continued to pump money into an unworkable system, says Ely

Oz, coordinator of the MIS program at Wayne State University in Detroit and author of the 1994 book *Ethics for the Information Age*.

"Nobody blew the whistle while \$25 million and three years of effort went down the drain," Oz says. Max Hopper, chief of AMR's information services unit, said in a letter to employees: "Some people who have been part of Confirm management did not disclose the true status of the project in a timely manner. This has created more difficult problems — of both business ethics and finance — than would have existed if those people had come forward with accurate information. Honesty is an imperative in our business — an ethical and technical imperative."

The classic response to ethical lapses is to write up a company ethics code, but there is considerable debate about whether such codes do any good. "There is a naive belief that an ethics code will fix it. But ethics begins where rules leave off," notes Maarten van Swaay, associate professor of computer science at Kansas State University in Manhattan, Kan.

But others say it is probably better to have a code than not if it clarifies what the company considers right and wrong, goes beyond generalities and addresses real-life work issues.

In a 1990 survey of IS professionals by Joan Pierson and Karen Forvill at James Madison University in Harrisonburg, Va., 49% of respondents said their organizations have no statement on computer ethics; 19% were not sure.

Testing to weed out the liars

One of the oldest debates in the computing field is whether society should be protected from shoddy programming by requiring information systems programmers to take some sort of official skills exam (CW, May 2, 1994).

Computerworld's survey of corporate IS professionals sheds some light on the topic: Sixty-nine percent say software engineers should pass a skills test before they work on critical systems.

The results may reflect the popularity of certification tests for particular vendors' platforms that result in designations such as Certified Hardware Engineer. IS managers rely on those tests because assessing the technical skills of IS employees is a difficult, time-consuming task, says Robert J. Melford, co-chairman of a task force on software engineering ethics.

Testing is also an important weapon against "resume inflation," one of the profession's biggest no-nos. Some IS job applicants lie on their resumes, saying they are competent in a computer skill that is in high demand.

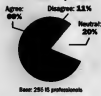
Harvey Bookman, president of Bookman Consulting, Inc., a New York-based IS testing company, finds that 30% of the applicants who claim to know the Smalltalk object-oriented programming language really "don't have the foggiest idea." Similarly, about 30% of the applicants who claim expertise in SAP AG's R/3 client/server applications "are reasonably incompetent," Bookman says.

—Mitch Reits

ethics survey

Critical skills

"Software engineers should pass a skills test before they work on critical systems."



ethics survey

How do you compare?

How IS people ranked the ethical standards of other professions

1. DOCTORS
2. IS PROFESSIONALS, ACCOUNTANTS
4. LAWYERS
5. MEMBERS OF CONGRESS

*7th

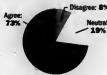
Best: 255 IS professionals

Source: Computerworld

ethics survey

That whistling sound

"If my company planned to use IS information systems in unethical or unfair ways, I would blow the whistle, even if it jeopardized my job."



Confirm. AMR Corp.'s ill-fated effort to build a huge reservation system for hotels and rental car companies. The project was canceled in mid-1992 with much finger-pointing and many lawsuits and countersuits.

A key problem was that none of the system developers gave their business partners an honest assessment of the technical problems, which meant the clients continued to pump money into an unworkable system, says Ely

RESOURCES

- Computer Ethics Institute, Washington, (301) 469-0615.
- Ethics Resource Center, Inc., Washington, (202) 434-8461.
- Business Software Alliance, Washington, (202) 872-5500; anti-piracy hotline, (800) 688-2721.
- Software Publishers Association, Washington, (202) 452-1600; anti-piracy hotline, (800) 388-7478.

"Whistle-blowing occurred more frequently in those organizations with published computer ethics statements," the study's authors say. "One reason may be that employees of organizations with codes of ethics can be certain of what is and what is not computer misuse."

OPEN AND HONEST

Perhaps even more important than an ethics code is a climate in which employees feel free to admit mistakes, air bad news and raise ethical concerns without fear of hurting their careers, experts say. Otherwise, project status meetings are full of happy talk and no one raises the critical issues.

Jim O'Neill, a senior security consultant at Pacific Bell in San Ramon, Calif., says his company encourages employees to contact senior management or a company ombudsman who handles ethics issues confidentially. "Companies would prefer to address ethical issues in-house rather than read about them on the front page of *The New York Times*," O'Neill says.

Ultimately, the IS department's approach to ethics will be determined by the corporate culture, the moral fiber of the IS employees and the priorities of the top IS executive.

"Sometimes IS directors have this self-image [as technology implementers] and believe they can't step out of that role," says Jim Rose, IS director at the National Association of Insurance Commissioners in Kansas City, Mo. "But if you perceive a larger role of helping the business achieve its mission and goals, well, that includes ethics."

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It pays to be sure

CONTINUED FROM PAGE 106

it's only one factor to consider, skill verification pays off. "It benefits us when we're benchmarked against the industry by offering educational opportunities, some employees will take advantage of it who otherwise would not seek out education," she says.

Another strong believer in employee education is the United Services Automotive Association (USAA) in San Antonio. While the firm does not mandate skills certification for its employment, it spends about \$4 million annually supporting self-study, whereby employees pursue education on their own time.

Jan Collins, manager in the employee education department at USAA, reports that 184 of the company's 1,700 IS-related employees have received professional certification from the Institute for Certification of Computing Professionals. In addition, the company is establishing a

method for tracking employees' career paths, salary levels and promotions to better tie education to performance.

In addition, companies such as State Street Bank & Trust Co. in Boston and Pacific Bell are moving toward a market-based system for employee compensation — in which employees are paid market value for jobs. Firms hope this will encourage the pursuit of professional certification and growth.

"We've found an inverse relationship in salaries where people with different skill sets are paid the same," says David J. Sedon, executive vice president and head of information technology at State Street. Information technology and human resources are in the process of defining skill sets for jobs and salary ranges.

With approximately 1,200 IS employees, State Street has certified and non-certified professionals on staff, and measuring payback depends on the certification. "We can measure whether we're getting our money's worth with a certified network engineer because the results of their work, implementation and

performance are visible — either the network runs or it doesn't," he says.

From 18% to 30% penetration

Whether rewards are easily measured or not, interest in certification is expected to continue. Currently, 18 of every 100 IS employees on average are certified. In six months, this number is expected to increase to 30 employees. While that growth is not staggering, industry watchers say multivendor certification will continue to foster interest.

For example, after spending 18 months investigating corporate interest in multivendor certification and talking with vendors, the Network Professional Association (NPA) will announce professional certification in multivendor platforms and technology this year.

"Our product solutions are multivendor, and we need individuals certified in multivendor platforms and technology," says Berkeley Geddes, president of the NPA in Irvine, Utah.

Hester is a freelance writer in Boston.

Proof is in the pudding

State Street Bank finds it easier to measure proficiency with some certifications than with others. "We can measure whether we're getting our money's worth with a certified network engineer because the results of their work, implementation and performance are visible — either the network runs or it doesn't," says David J. Sedon, executive vice president and head of information technology. Programming certification, however, is more difficult to measure because of lag time associated with development.

Pacific Bell no longer sponsors four-year college degree programs. Instead, the company's educational thrust is on certification programs that are shorter and more focused. "We weren't getting the bang for our buck," says Christine Johnson, human resources specialist.

The United Services Automotive Association strongly believes employee education benefits both the workforce and the customer. In fact, 184 of the company's 1,700 IS-related employees are certified by the Institute for Certification of Computing Professionals. "We believe we get what we pay for," says Jan Collins, manager in the employee education department.

Picking up the tab

85% of 231 companies typically pay for related training.

79% of 223 companies typically pay for certification tests.

Source: Deloitte & Touche Worldwide Services Group, Washington, Mass.

EXAM TYPE

Tests taken

Tests taken between 1993 and 1994

	1993	1994
Application development	136	17,149
Client/server	81	15,192
Networking	10,422	29,163
Operating systems	14,001	34,528

Source: Oracle Pressbooks, Hillsdale, N.J.

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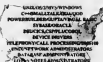
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2. The history of the course	Dr. Smith	15
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5. The structure of the course	Dr. Smith	15
6. The methods of the course	Dr. Smith	15
7. The resources of the course	Dr. Smith	15
8. The evaluation of the course	Dr. Smith	15
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Communications	X.25	\$64,906
	USB.2	(22,191)
Local Area Networks	Novell/Netware	361,540
	Ethernet	248,973
Office Automation	Lotus/Notes	44,241
	MS-Word	(20,105)

SOURCE: Skill Survey of Computerworld's Audience, August 1994.

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Regional Scope

ST. LOUIS, KANSAS CITY

INQUIRE WITHIN

No matter which side of the state you prefer, you can find many Missouri companies with help wanted signs for client/server and networking expertise

By Jill Vitell

St. Louis and Kansas City may be as different as night and day in terms of culture and corporate mind-set, but they have one thing in common: technical jobs to spare.

"As one who is trying to recruit new hires, I know the job market is fantastic right now," says Cynthia Lau, information systems director at Children's Hospital in St. Louis.

Recruiters are shaking the trees all across Missouri, but few job candidates are leaving Seasoned professionals are especially hard to find, IS managers complain.

"Companies want to hire a person who's been down the client/server road," says Ron Maupia, founder of DF Career Associates in Overland Park, Kan., located off near Kansas City, Mo. "It's not even a matter of years of experience because

there aren't that many people with many years in client/service."

In fact, companies are paying unusually high premiums for these skills. According to Maupia, midlevel programmer/analysts with just one year of client/server experience command salaries of up to \$60,000. "It's crazy," Maupia says.

Fortunately for job seekers, the hunger for talent isn't limited to the state's western side. Appetites in St. Louis, 260 miles away, are just as healthy.

"Health care and financial services are hot right now," says Bruce Bauer, president of Executive Career Consultants, Inc. in St. Louis. Bauer has 10 Unix systems administrator jobs, 10 Oracle Corp. database administrator jobs and plenty of C and C++ developer positions to fill.

Lau just also fill 10 IS spots. These include senior positions such as project leaders and analysts with knowledge in Unix, database administration and SQL.

However, the lack of available talent has been discouraging.

"We're surprised [that we're] not seeing broader range of resumes," says Eliot Hauge, associate vice president of computing and IS at St. Louis University. Hauge is trying to fill four new positions in his department of 70 and has posted job openings at the university on the State Employment Network (a job referral system for the state's employees) and in the local newspaper.

Search party
Even IS hiring managers in Kansas City are singing the blues. Blue Cross/Blue Shield of Missouri and Allied Signal Aerospace Co., for example, are searching for programmer/analysts with five to seven years of experience.

In addition, Kansas City's public school system, one of the city's largest employers, has three openings in its 60-person IS department. New hires will grapple with challenges such as wide-area network installation, but the positions haven't been easy to fill, says Rick McAfee, chief information officer at the Kansas City school district.

Local newspaper advertisements have yielded few resumes. Circulating news of the positions internally and by word of mouth have also proved ineffective. McAfee may decide to hire college graduates.

Inquire within, page 111

St. Louis

Largest employers (by number of employees):

- McDonnell Douglas Corp.
- McDonald's Corp.
- Southwestern Bell Telephone
- Washington University
- Schnuck's Markets, Inc.
- May Department Stores Co.
- Trans World Airlines, Inc.
- Barnes Hospital
- St. Louis University
- Anheuser-Busch Cos.

Unemployment rates down



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Regional Scope

Inquire within

CONTINUED FROM PAGE 110

ates for the programming positions but intends to hold out to a more senior spot he must fill on the telecommunications side. "We're at a disadvantage because we aren't as recruiters," McAfee says.

IS managers can only guess at the reasons for the shortage of job seekers. Some feel pent-up demand for technologies is finally being met. Even though economic growth in the two Midwestern cities has slowed somewhat, companies are investing in new tools and are more apt to hire permanent employees to manage them.

The early '90s trend of contract employment seems to have peaked, although many organizations still hire contractors and bring in consultants to help migrate from mainframe technology to client/server standards.

Hot commodities

Consulting firms are also an issue. "Consulting companies have gobble up project managers," says Sam Lutton, vice president of IS at Continental Baking Co. in St. Louis. "When you have people involved in state-of-the-art projects such as Unix, client/server and interactive applications, they develop skills that are in

high demand, and they're gone in a flash."

Recently, Lutton lost several highly skilled individuals to competing companies and consulting and software development firms. But the attrition is not unexpected because the firm is being purchased by Interstate Brands in Kansas City.

Another St. Louis company in transition is Pet, Inc., which was recently acquired by Pillsbury Co. and is scheduled to finish its move to Minneapolis by the end of the month. "There are so many opportunities in St. Louis that most of the staff members are going to Minneapolis," says Bob Drury, vice president of MIS at Pet.

That's especially good news for departments undergoing re-engineering efforts such as Mallinckrodt Medical, Inc. in St. Louis. "We are starting the IS organization from the ground up," says Vicki Atkins, manager of corporate operations.

While the company has had layoffs and job eliminations, the IS group has not reached that point. Insiders expect the department of some 120 staffers to be cut significantly, however.

"The buzzword for the '90s is change," Atkins says. "With all the mergers, acquisitions, right-sizing and re-engineering, we better understand that change is inevitable and learn to live with it." However, the threat of job loss in a hot

job market is not nearly as unsettling as in a stagnant one. Yet, a job offer is always a comfort.

Many employees will be offered positions and the opportunity to relocate to Kansas City, Lutton says. But according to residents in both cities, Missourians don't migrate readily between the state's two largest cities.

"There's not much movement between Kansas City and St. Louis," says Brian Huesers, IS director at H&R Block's headquarters in St. Louis. "The two regions are very different."

Local opinion states that St. Louis identifies much more with Chicago and the East, while Kansas City allies itself with neighboring Midwestern cities such as Wichita, Kan.; Omaha and Tulsa, Okla.

While St. Louis faces the corporate flight and downsizings typical of other older, more established cities, the younger, smaller Kansas City is a magnet for investment and enterprise.

Bartle Hall, the city's convention center, was recently expanded to accommodate more business. Hoteliers are vying to construct another 1,000 rooms to add to the 1,200 already within walking distance of the renovated convention cen-

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- State of Missouri
- Hallmark Cards
- Health Midwest
- Fort Leavenworth
- Kansas City (Missouri) Public Schools
- University of Kansas Medical Center
- AT&T Corp.
- Ford Motor Co.

Unemployment rates down

February 1995	4.1%
February 1994	5.1%

Kansas City on-line

Get information about economic trends, business climate and places to work on the Internet:

<http://www.kcity.net/~emf/kchomepage.html>
http://www.yahoo.com/Regional/Information/States/Missouri/Kansas_City

ter Gateway 2000, Inc. recently moved into town, and Home Office Computing magazine rated Kansas City as one of the nation's best cities to start a business.

"Kansas City is a great city," Huesers says. "It has a small town atmosphere with a larger town's services."

Vicki Atkins is a freelance writer in East Brunswick, N.J.

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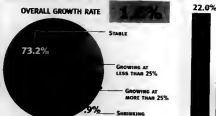
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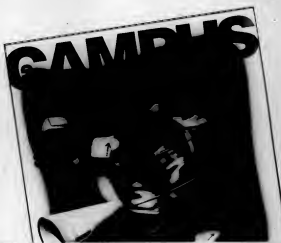
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(subject to revision)

- The best places to work in IS
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- Information Systems salaries from Computerworld's annual survey with the Association for Systems Management
- And much more!



Marketplace



Dying for data

A new generation of end-user data access tools unites query, report writing

Business Objects 3.1

Synopsis: Business Objects 3.1 has captured a lead in the market. It enables IS to create universes that provide a logical view of data that usually exists on multiple tables and databases and often runs on different platforms. Users create queries by selecting query objects, applying conditions and specifying the sorting order.

Ease of use: Users are shielded from SQL and the database structure. They assemble queries by clicking on familiar objects. **Administration:** It requires administrators knowledgeable in SQL and familiar with the database structure to create and maintain the universe and query objects.

Database access: Includes Oracle, Informix, Red Brick, SQL Server, Ingres, dBase, DB2 and ODBC. **Platform support:** Windows, Macintosh. **Model:** Price: \$950 (user), \$5,000 (administrator). *Business Objects, Inc.*

Capertown, Calif. (608) 973-9900

Q+E 6.0

Synopsis: Q+E 6.0 provides a spreadsheet-like interface to data from a wide range of Open Database Connectivity-compliant databases. Users build queries by clicking on tables and fields and specifying conditions and sort order in a dialog box. Rather than hiding SQL, Q+E lets users view and even edit the SQL code if they want.

Ease of use: Q+E 6.0 does not fully hide the complexity of the underlying data structures. Novice users may be intimidated, but power users may like having access to the actual SQL code. **Administration:** An extensive set of tools allows administrators to grant graduated levels of access and privileges to individuals and groups of users. **Database access:** Accesses databases through ODBC rather than native drivers. It boasts access to more than 30 ODBC-compliant databases. **Platform:** Windows. **Price:** \$499.

Interleaf, Inc., Rockville, Md. (301) 230-3200

Impromptu 3.0

Synopsis: Impromptu 3.0 lets users interact with data, making more queries as needed. It uses a word processor metaphor that lets users create frames where they can drop data. Data is accessed through the Impromptu Catalog or data listing. **Ease of use:** Looks and feels vaguely like a Windows word processor or spreadsheet. The use of frames, the Catalog and clicking and dragging allow users to get up to speed quickly. **Administration:** IS must define the data and create the joins in the Catalog. After the first level of joins are made, logic in the Catalog takes over and makes future, indirect joins automatically.

Database access: Includes Oracle, OmailSQL, Server, SQL Server, Sybase System 10, Informix, Ingres, InterBase, Btrieve, dBase, Paradox, SQLBase and ODBC. **Platform support:** Windows. **Price:** \$495 (user), \$595 (administrator). *Cognos, Inc., Burlington, Mass. (617) 229-6600*

InfoMaker

Synopsis: InfoMaker is positioned as an end-user query and reporting tool. But with its built-in Watson database, integrated data migration utilities and close integration with PowerBuilder, it may appeal more to developers who need to build fast, simple front-end data access applications.

Ease of use: Requires familiarity with database structure but does not require users to write SQL. English Wizard lets users create queries using plain English. **Administration:** IS can set limits on queries to conserve resources, control joins and create custom controls.

Database access: Supports most major desktop relational and nonrelational databases and all leading server-based relational databases, ASCII text, Excel spreadsheets and ODBC. **Platform:** Windows. **Windows NT Price:** \$249. *PowerSoft Corp., subsidiary of Sybase, Inc., Concord, Mass. (508) 287-1500*

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By Alan Radding

There's no shortage of options for impatient business managers who want to get at data themselves. Today, nearly every new desktop application has some sort of data access capability, says Chet Gesschick, senior analyst at Harwitz Consulting Group, Inc. in Newton, Mass., and editor of "Tool Watch."

Desktop databases such as Lotus Development Corp. Approach or Microsoft Corp. Access and even spreadsheets have sophisticated database access capabilities. Pick your metaphor—a spreadsheet, the desktop database, a reporting tool—and someone will give you database access," says Donald A. DeChassis, senior analyst at Forrester Research, Inc. in Cambridge, Mass.

Marriage of tools

Within this wide range of options, there is a new generation of end-user data access tools, Gesschick says. These tools combine querying, which is the process of formulating a request for data from the database, and report writing, which is the process of presenting the results of the query in a meaningful way. "Querying and report writing often required different tools. Now they're being combined," he says.

The tools allow end users to create ad hoc queries without knowledge of SQL and visually format reports. They do not eliminate information systems departments from the process, however. The easily understood names and descriptions of data and the convenient reorganization of data along logical function and business lines typically are prepared in advance by IS. In turn, IS staffers rename columns and join tables to isolate end users from the rough-and-tumble world of actual database structure.

Key features include ease of use and ease of setup and administration for IS, direct database access, report writing, platform support, heterogeneous database joins, security, read/write access, performance, analysis capability and programmability. The last two features are particularly important if organizations want to use the tools to create executive information systems and decision-support system applications. Administrators need features to control access to data and prevent runaway queries.

Leading products include those listed in the boxes at left as well as Information Builders, Inc.'s Focus Reporter for Windows and Software AG of North America's Info Expert.

Radding is a freelance writer in Newton, Mass.

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Mac users fight Windows 95 threat

CONTINUED FROM PAGE 1

The proposal contends that the as-yet-unshipped Windows 95 operating system will eliminate productivity differences between Windows and the Macintosh, equalize the levels of support needed to maintain the two operating systems and significantly reduce the cost of purchasing hardware.

"We are looking at things from an enterprise standpoint, and we're trying to streamline the way we do design and acquisition. We have undertaken an effort to look at the tools we are using to connect users, and we are trying to figure out what we have, what is outdated and what we ought to have," Phillips explained. "We are dependent on information sharing, and it is not clear that process will be transparent across platforms."

According to the proposal, the price tag for standardizing on Windows 95 is estimated at \$77 million to \$108 million, while the cost of going to a Macintosh-only environment is \$70 million, the sources said. However, proponents of the proposal figured in risk and benefit factors and deemed Windows 95 the safer bet, the sources added.

The final decision will ultimately be made by Mel Broshers, executive vice president of Lockheed Martin.

"We want to select a standard suite of hardware and tools, but absolutely no decision has been made at this time," said Pat Anderson, executive vice president of Lockheed Martin's Enterprise Information Systems (EIS) company in Sunnyvale.

"EIS is evaluating whether or not to choose a single platform, and it is not clear which way it will go," Anderson said. "The standardization discussion revolves around two central issues: cutting costs and regaining control over the technology."

Cost-cutting is a key theme at the Sunnyvale, Calif., aerospace firm, which has hit several air pockets in recent years, forcing layoffs of more than 10,000 workers in the past three years and a March merger with rival aerospace giant Martin Marietta Corp. But internal sources insist the merger was not the impetus to move to a universal hardware and software platform.

"Information services wants absolute control. Right now users have control," said one source inside the company.

Historically, under a distributed approach, users were allowed to select the platform they deemed best. For the majority of employees, that was the Macintosh. Lockheed Martin has 9,171 Macintoshes and 8,535 PCs.

One rapid Macintosh user at Lockheed Martin said a decision of this magnitude "constitutes a religious war" and that all those involved should expect to be "nasty and very bloody."

Another Lockheed Martin Macintosh user said, "One size doesn't fit all" and that the company is likely to lose any competitive advantage it may have by switching technologies.

However, Phillips said, "It is not clear that Apple's long-term position in the marketplace will give us the stability we need."

For now, the Macintosh users are joining forces to work through established channels to seek as much information as possible to top executives in hopes of discrediting the Windows proposal.

"Mostly we are getting the information

out. That's the most important thing. We are sending E-mail and meeting informally to talk about the situation," another Macintosh user said.

Some Macintosh users said they are more worried about getting little or no support for information systems in the interim than the possibility that their beloved Macintoshes will be replaced by Windows machines.

"If you're in the EIS organization and the company says the direction is Windows and PC hardware, how much effort are you going to put into supporting enterprise solutions for the Mac?" asked a third Lockheed Martin Macintosh user.

If Lockheed Martin does decide to go with Windows, it would strike a major blow at Apple, which has already lost a handful of major accounts in the past three years.

Including Ernst & Young, Boeing Co., KPMG Peat Marwick & Young, Becton Co., Abbott Laboratories and Visa International, Inc.

Apple declined to comment.

Total cost of ownership for one unit over five years*

DOS	\$41,336
Windows	\$41,439
Macintosh	\$35,124

*Includes hardware and software purchase, maintenance, support, administration and operations.

Source: Gartner Group, Inc., Stamford, Conn.

Desktop aerodynamics

Best desktop computer at Lockheed Martin: 15.7%



Outdated PCs (18% and below)

Up-to-date PCs (18% and above)

*Includes all internal hardware that Lockheed Martin uses and has operating under a total cost of ownership.

Source: Lockheed Martin, Sunnyvale, Calif.

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News Shorts

Fore Systems

expands ATM manager
To help more administrators control the emerging cell-switched LANs and wide-area networks, Fore Systems, Inc. in Warrendale, Pa., will upgrade its monitoring and configuration software for Asynchronous Transfer Mode (ATM) connections this week.

Version 3.0 of ReView now works with the dominant network management consoles—SunSoft, Inc.'s SunNet Manager on SunOS and Solaris as well as Hewlett-Packard Co.'s OpenView—and comes in a self-contained console that can run on Microsoft Corp.'s Windows NT. Versions for Unix consoles start at \$4,995, a stand-alone version starts at \$2,495.

HP's Dial-A-Lan debuts

Hewlett-Packard Co. today will release its AdvanceStar Dial-A-Lan, a stackable hub codeveloped with Shiva Corp. that comes with built-in remote access. A two-port model comes with built-in V.34 modem, while a four-port model uses external modems. HP said it will ship the remote access modules in July at prices from \$2,399 to \$3,599.

HP, partners untangle network alarms

CONTINUED FROM PAGE 1

as well as from mainframes, servers and desktop systems—that is if the new tools do not spark renewed turf wars between information systems and network managers accustomed to controlling their own fiefdoms.

"Most companies don't have a problem with tools. They have a problem getting tools properly applied [despite] organizational boundaries," said Larry Kreighbaum, a network management analyst at Amec Corp. in Tulsa, Okla.

In distributed computing environments, network administrators have been forced, until recently to manually figure out the relationships among alarms received from multiple network devices.

But some network management applications—including NerveCenter, Cabletron Systems, Inc.'s Spectrum and Boole & Balaban's NetCommand Plus—now support automated event correlation. This means that alarms flooding in from disparate network components are viewed in relation to one another and filtered to identify, for example, a single faulty router that triggered them.

The NerveCenter/LANAlert/OpenView integration will allow users to create automatic event prioritization, filtering and response schemes that span not just networks but mainframe, midrange and PC systems, sources close to Los Altos, Calif.,

based NetLabs said. Network Computing is based in Santa Clara, Calif. NerveCenter will collect and filter alerts from NetWare servers and correlate those alerts with alerts from TCP/IP networks.

This will let administrators rapidly understand the relationships among multiple events in enterprise client-server networks. Currently, they must react to each event separately or manually correlate events across multiple network and systems management applications.

One user welcomed the prospect of bridging the previously insurmountable gap between network and systems management domains.

"We're not really doing server management yet, but it's coming," said Paul Edmunds, a senior systems analyst at Duke Power Co. in Charlotte, N.C., and an OpenView user in the future, he explained, correlation-based management systems will provide "more meaningful information from servers and applications."

While Duke Power currently does not use NerveCenter, Edmunds noted, its new capabilities "will make us look harder at it. It parries what Cabletron is trying to do

[with its Spectrum management platform] and gives NetLabs equivalent strength on the OpenView platform."

Analysts hailed the integration but agreed that organizational barriers could limit some users' ability to profit from it. "You really have to understand your network and how it behaves before you can take advantage of this," said Jill Huntington-Lee, a principal consultant at Brandway Network Associates in Cincinnati, N.J. Groups that closely coordinate network and systems management are in the minority, she added.

Another fly in the ointment, Kreighbaum said, is the lack of both a standard for how you document the dependency relationships between network and system components and a standard repository for network management information. While such a repository "is likely to be built on a relational database management system, it is too slow for looking things up in real time," he said.

Currently, Amec uses Boole & Balaban's Command Plus systems management software. Although it "has some facilities that enable us to correlate things, the reality is that what bring all alarms into one display so operators can use them and correlate in their heads," he said.

Firms chip away at next generation

Despite a dramatic number of dropouts, a race is still under way among microprocessor makers to see which will be among the survivors to make it past the year 2000.

As anyone can see, the field is still too crowded — the latest 586 family, SPARC, MIPS, Alpha, PowerPC, Precision Architecture. More runners will have to fall by the wayside before the millennium milestone. The \$1 billion expense of designing a next-generation chip is ruthlessly weeding out the entrants that fail to generate high volumes of sales.

As the grueling contest continues, one group of onlookers has a more than casual interest. High-end Unix server makers such as Sequent, Convex Computer and Pyramid Technology are watching anxiously lest the contestants they are betting on falter. Their winds of change are blowing their way, and they want to be around long enough to reap the reward of 12 to 14 years' effort. If their runner stumbles and falls, however, they will go down with him.

This is not a race for the faint-hearted. Stratix has switched its processors three times; few of the changes have occurred in the past three years. "They seem to be changing platform forms like they change socks," said Jim Johnson, chairman of The Standish Group.

The first to abandon the contest were the mainframe makers — with the exception of Hitachi, Amdahl, Fujitsu, Unisys and IBM conceded that the next generation of big iron would not be worth another round of investment in bipolar center-coupled logic, even though their proprietary microprocessors offered advantages in speed. Instead, they will use lower-cost CMOS chips and/or other manufacturers' chips. IBM is trying to consolidate product lines around the Power architecture; RS/6000 workstations, the AS/400 midrange and SP/2 parallel processors.

Kendall Square Research, Thinking Machines and Cray Computer all ended up in bankruptcy, partly because of the expense of

proprietary logic.

The server manufacturer with the surest bet is Sequent. Its high-end symmetric multiprocessing line, the Symmetry 5000, is based on Intel's Pentium processors. When the Pentium calculating flaw appeared, Sequent didn't wait for Intel to attend to the matter. It supplied a software fix on its own.

Sequent launched the Symmetry series 11 years ago, and unlike the PC suppliers that are the server winners, Sequent builds hardware exceeding generation with large-capacity buses, high-speed cache and hefty I/O throughput.

Convex last fall lined up behind Hewlett-Packard's Precision Architecture.

This is an indirect Intel play because HP and Intel are code-developing a combined future generation that will appear after two more iterations of Precision Architecture.

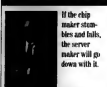
In effect, Convex's Exemplar is now HP's high-end, parallel processor, the area where HP was weakest, and Convex's 13 years' experience are more likely to pay off in this new positioning.

Pyramid, recently purchased by Siemens/Nixdorf, remains an innovative designer with its fault-resilient Nix line. It is continuing with Silicon Graphics' MIPS R4000 chip as it launches its first parallel processor. Its design aligns sets of SMP processors as nodes working in parallel. (Pentium Computers also based its H-mega series on MIPS.)

None of these server makers chose Digital's Alpha chip despite its current speed advantage (although Cray Research uses Alpha in its T3D and SPARC in its C86400 servers).

The future Unix server is likely to look very much like the leading products of these three manufacturers — advanced designs built around standardized microprocessors. But selecting one means choosing not only the best design but also the chip architecture that your shop believes has the strongest future.

Robert K. Coopers and Lybrand's technical editor. His Internet address is rcoopers@ciw.com



Charles Babcock

If the chip maker stumbles and falls, the server maker will go down with it.

Inside Lines

Half a roll is better than none?

After a more than six-month delay, IBM finally plans to deliver its first round of PowerPC-based systems on June 19. Yet these machines, which are based on the 604 and 601 RISC microprocessors, will not ship with a PowerPC release of OS/2. They will come with Microsoft's Windows NT and IBM AIX Unix operating system. An early beta user and some OS/2 developers working with the pre-release code claim that the operating system will not come out until Coherent/PA in November. When asked about it last week, IBM officials said they are sticking with their story — a final beta in June and delivery in September.

Servers, servers everywhere...

Compaq won't be alone for long in its quest to supply the enterprise with servers. AT&T Global Information Solutions and Zenith Data Systems are right behind it. A source close to AT&T GSI said the firm will unwrap quad-processor systems based on Intel's 100-MHz Pentium chip later this month. The addition to AT&T's high-end Globusnet 4116 XL line of PC servers will support hot-pluggable drive bays, fast and wide SCSI controllers and 100Base/Tcapable Ethernet cards. Meanwhile, Zenith Data is set to unleash three new multiprocessor servers, including a four-way system based on a 100-MHz Pentium chip, a company source said.

In the fine tradition of Apple deliveries

Power Computing, the first Macintosh clone vendor, is running into some early start-up problems. The company began shipping Macintosh clones May 1 but has already shipped behind delivery schedules. Last week, Internet lines were buzzing with several angry users who claimed that the Austin, Texas, company was taking an inordinately long time to execute orders. Some frustrated customers threatened to cancel their orders and a few actually did. According to a company spokesman, the delays are not the result of production glitches but because "we are almost and in making sure that the systems are 100% Mac compatible."

Food fight, part two

A spat between IBM and EMC that began in March when EMC issued a press release bemoaning IBM's Rasmus mainframe disk array has escalated beyond marketing into the legal realm. An IBM attorney earlier this month fired off a letter to EMC calling its claims false and demanding that it stop saying nasty things about Rasmus. EMC's legal hounds seek back a "nuisance" to "respond last week.

Fast Ethernet, fast Ethernet

The first "fast" Ethernet repeater to simultaneously support unshielded twisted-pair and fiber cabling will be unveiled today at Grand Junction Networks in Fremont, Calif. The FastHub 100 T/FX, which is designed to give companies an integrated method of attaching twisted-pair-based devices to a fiber backbone, will cost \$290 per port, or \$4,495. "Fast" Ethernet is designed to carry data at 100M bit/sec.

Long time coming

It was almost a year ago that IBM executives divulged plans for supporting RS/6000 symmetric multiprocessing (SMP) modules on the company's SP/2 parallel systems. But high-powered Unix shops looking for better price/performance from the SP/2 must wait another year to actually get the SMP option, which will pack four processors into a single SP/2 complete node. IBM said it does not expect to deliver on its promise until the second half of next year.

Governments everywhere are big on subsidies for desperate causes, so perhaps it's no surprise that the leaders of the world's largest economies are all subsidizing computers at the Group of Seven Economic Summit starting June 15. The leaders will sing about the technology fray, but each will have an assistant, called a sherpa (we kid you not), who will be outfitting with a Fujitsu Stylis 600 pen computer. If your sherpa can't make the call for you, though, do get in touch with Computerworld about news items or give us our 24-hour voice-mail tip line at (800) 826-6668 or our toll-free number at (800) 348-6474. News editor Maryfrank Johnson can be reached by phone at (800) 820-5170 or via the Internet at mjohnson@cw.com.

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